

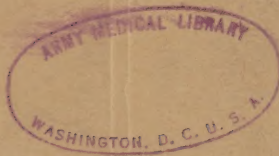
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WAR DEPARTMENT

TECHNICAL MANUAL

**OUTLINE OF NEUROPSYCHIATRY
IN AVIATION MEDICINE**



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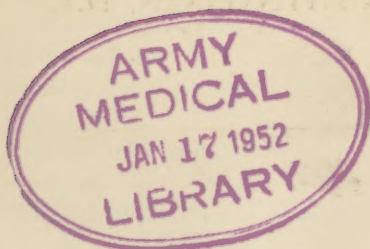
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WAR DEPARTMENT,
WASHINGTON, December 12, 1940.

OUTLINE OF NEUROPSYCHIATRY IN AVIATION MEDICINE

Army
Prepared under direction of the
U. S. Surgeon General's Office

	Paragraphs
SECTION I. General.....	1-3
II. Descriptive psychology.....	4-9
III. Causes and nature of mental disease.....	10-13
IV. Dynamics of behavior.....	14
V. Mental mechanisms and motives.....	15
VI. Psychobiological constitution and reaction types.....	16-17
VII. Classification of mental disorders.....	18-21
VIII. Symptoms of mental disease.....	22-32
IX. Psychopathic personality.....	33-34
X. Minor psychoses.....	35-38
XI. Epilepsy.....	39-54
XII. Schizophrenia (dementia praecox).....	55-62
XIII. Manic-depressive psychosis.....	63-73
XIV. Involutional melancholia.....	74-78
XV. Paranoia.....	79-85
XVI. General paralysis of the insane.....	86-99
XVII. Tabes dorsalis.....	100-107
XVIII. Infection exhaustion, toxic, and symptomatic psychoses.....	108-114
XIX. Psychoses associated with organic diseases of, and injury to, the brain.....	115-118
XX. Senile psychoses.....	119-120
XXI. Epidemic encephalitis.....	121-133
XXII. Neurology.....	134-142
XXIII. Neuropsychiatric examination.....	143-157
APPENDIX. Bibliography.....	Page 162
INDEX.....	165

SECTION I

GENERAL

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	Paragraph
Object.....	1
Basic fundamentals.....	2
History of mental disease.....	3

1. Object.—The objective of this manual is to instruct medical officers, Regular, National Guard, Reserve, or those of other Federal departments interested in aviation medicine, so that they may attain a thorough working knowledge of the psychopathology underlying the various forms of mental disease with their symptoms and treatment; and a working knowledge of the neurological examination required in the examination of candidates for flying training. This mission will necessitate a rather thorough course in neuropsychiatry as a whole.

2. Basic fundamentals.—In outlining the basic fundamentals as known at present, involving both the so-called normal and abnormal conditions of the psyche, it will be necessary to study the development of the mind and its purpose. This will be done from a psychobiological viewpoint, endeavoring at all times to consider the individual as a whole; that is, the behavior of the human organism as a unitary system engaged in adjustment to its environment.

a. The dynamics of behavior and psychic energy, mental mechanisms and motives, conscious and unconscious processes, all lead up to the causes and nature of mental disease. The psychology of mental disease will be discussed at length.

b. Border-line conditions will be of more concern than actual psychoses. Actual psychoses are perhaps not as prevalent among applicants for flying training; however, the percentage is practically the same as in any other field of endeavor or profession.

c. There are three large groups who come into the Air Corps. First, those who are apparently highly enthusiastic about flying because of flying itself; second, those who would increase their economic standing; and third, those who wish to give expression to a compensatory superiority developed because of an inherent or acquired inferiority which they must counterbalance; that is, demonstrate to society that they are really supermen in spite of what society considers them.

d. Aviation medicine is an interesting specialty but carries with it responsibilities that are not to be considered lightly. Aviation is still dangerous and will continue to be so at least in this generation. Pathologic psychological types cannot be prevented from applying for flying training, but applicants can be studied and flight surgeons

trained so that these types are recognized at the outset and their initial appearance into the Air Corps prevented. Aviation medicine as a specialty is comparatively young and those interested in the personality as a psychobiological entity find that there is much research that can be done to ascertain what that psychobiological entity must have and develop in order to produce a military aviator under proper flying instruction.

e. As nearly as possible, the views of the leaders in American psychiatry will be presented.

f. As a nomenclature for the different clinically recognized mental diseases, that which has been adopted by the American Psychiatric Association will be described. The present tendency in psychiatry is to use descriptive terms in the diagnosis of mental diseases, but it is believed that this nomenclature will be of more value at the present time.

g. If flight surgeons have any reason for existence, it is that they have been trained to select applicants for flying training, and when these applicants have been selected and trained, to see that their physical and mental efficiency is maintained. It is recognized by those in actual contact with large groups of patients that at least 60 percent of all complaints contacted are of psychogenic origin. Training must be given so that these border-line conditions may be recognized.

h. The strain of flying, which first saps the nervous system because it is the most highly organized system of the body, brings out the latent tendencies of the individual and it is these latent tendencies which must be recognized so that the individual may be properly treated.

3. History of mental disease.—*a.* A review of history shows that mental disease was recorded at the beginning of written time of both the Eastern and the Western worlds. The Old Testament records Saul's periods of depression, indicating he was a cyclothymic. Nebuchadnezzar is also mentioned, his symptoms being characterized by delusions. In Western history are recorded the oracles, which were probably hysterical manifestations similar to our present day mediums.

b. To explain these abnormalities at the time they were recorded, the thought and knowledge of the period must be considered, and as Hart calls them, "conceptions of insanity" were evolved. These conceptions are continually being evolved, and today the psychological conception is perhaps the more universally accepted.

c. In history is first found the "demonological conceptions." The phenomena at this period were considered as due to demons, and in

harmony with the religious views of the time, as being due to either the devil or the Deity, which naturally developed a religious method of treatment, such as ceremonials.

d. Hippocrates is given credit for evolving the first conception which can be considered as logical to present day thinking. He laid down the fundamental that the brain was the organ of the mind, and that as a sequence, mental disturbances were due to some pathology of that organ. This view disappeared during the Dark Ages, as did almost every other intellectual development, Scholasticism and mysticism replacing true science, and the demonological conception again prevailing. The result was that those having the various delusions and hallucinations were saints and holy men and therefore revered. At this time witchcraft flourished, and even today followers of witchcraft are found who are classified among the mentally unstable. During this period many were executed because of these tendencies. Perhaps this was an unsatisfactory method of treating these unfortunate individuals, but considering these events from a purely biological viewpoint, a bettering of biological life should have been the outcome. Witness the sterilization of the unfit at the present time. However, science and humanitarianism soon flourished again, and mental disease was again considered as due to some disturbance of the brain. So at the beginning of the nineteenth century, the modern physiological conceptions were becoming definitely established.

e. Prior to this time, a transition period was in vogue. This is termed the "political conception." The mentally diseased at this time were considered as having no claim on society. The individual was put away so that he did not disturb society.

f. England was the first to adopt humanitarian methods, about the end of the eighteenth century. Since that time, continuous progress has been made, and present institutions are model hospitals, with the patients considered as mentally ill, instead of lunatics.

g. Physiological research devoted to the study of the brain, anatomically and microscopically, leading to the facts of cerebral topography and the discovery that definite portions of the brain controlled definite bodily functions, were the important discoveries. This naturally led to the conclusion that the nature and causes of mental diseases had been found. Disappointment followed, as all mental disease cannot as yet be traced to physiological causes. The "psychological conception" therefore developed. The corollary basing this conception is that mental processes can be directly studied without reference to any accompanying changes which are presumed to occur in the brain and that mental disease may therefore be properly attacked from the standpoint of psychology.

h. Even in our time, psychology has been confused with mysticism, theology, and ethics. Great progress has been made due to such men as Janet, Kraepelin, Freud, Jung, Adler and Bleuler, and the psychological conception has become an accomplished fact. There have been eras in medicine, but fact has undermined theory in all instances and will continue to do so. However, at the present time there are two dominating conceptions, the physiological and the psychological, which are both founded on scientific fundamentals and which ultimately will develop into a true conception of mental diseases as to nature, cause, and treatment. The psychological conception considers the mental deviations as states of mind, the physiological as due to changes occurring in the brain itself.

i. The method of acquiring knowledge is the same scientifically no matter what the field of research or study. There are certain definite steps which are universally followed. First, there is the collection and recording of facts; second, the classification of these facts into series or consequences; and third, the discovery of a formula or scientific law which describes these facts in the most comprehensive and convenient manner. These steps are called the "method of science." These are illustrated by Keppler's formula and Dalton's formula, and both have been found to agree with the facts of experience, and therefore recognized as scientific law. Dalton's atomic theory went further, he was able to predict and resume facts which is the only justification a scientific law is required to possess. It was necessary for Dalton to use concepts, as his "atom" was, in order to explain the facts of experience. Thus we must distinguish between phenomena which are facts that can be observed, and concepts which are inventions of the scientist used to explain facts. Both, however, are of scientific value and use. Therefore, a complete description of the method of science evolves itself into the observation and recording of the phenomena; the classification of the recorded phenomena into groups and series; and the discovery of a formula which will explain these phenomena. These formulae may be altogether conceptual; however, the only test necessary as to the utility of the devised formula is that it explains the facts actually found. Therefore in order to scientifically establish research with the cause of mental disease, the foregoing method must be followed.

j. To further distinguish the physiological from the psychological conceptions, the physiological admits consciousness involved in the phenomena of mental disease, but assumes corresponding changes in the brain and therefore devotes all its attention to the brain in an endeavor to discover a "law" which will contain nothing but physiological terms, and which will describe these brain processes in the

shortest and most comprehensive manner. The psychological conception, however, regards the conscious processes occurring in mental disease as the actual phenomena, and so is in search of a law which will comprehensively describe these conscious processes and will naturally contain nothing but psychological terms. There can be no mixing of terms, as confusion would result. Any discussion of the connection between mind and brain, would lead us into philosophy with which this manual is not concerned. Therefore, these steps of the method of science must be presented in a logical order, eventually leading to definite understanding of the psychological conceptions of mental diseases and not forgetting the difference between phenomena and concepts.

k. Modern psychology employs conceptions which cannot be demonstrated, such as complexes, repressions, and unconscious mental processes, to explain phenomena which are observed. Phenomenal impossibilities exist as illustrated by the unconscious mental process, but they also exist in physics as illustrated by the weightless, frictionless ether. However, in both cases they are justified, because they explain in a convenient manner the facts of experience and satisfy the test of utility.

SECTION II

DESCRIPTIVE PSYCHOLOGY

	Paragraph
Mental processes.....	4
Definition of terms.....	5
The fundamental problem of life.....	6
Solving of conflict.....	7
Fixation of libido.....	8
Unconscious emotion.....	9

4. Mental processes.—a. General.—The psychiatrist studies the mental life of the individual. More particularly, he studies the mental life in its abnormal manifestations. Abnormal mental functioning will be better understood if there is clear comprehension of normal mental processes, therefore, before studying disordered mental functioning, a brief review is made of normal mental processes and understanding had of those psychological terms constantly occurring in the study of psychiatry.

- (1) The mental life embraces—
- (a) *Consciousness*, including all the mental processes concerning which there is awareness, distinct or indistinct, at a given moment.
- (b) *Fore-consciousness*, that region from which material may readily be recalled.

(c) *The unconscious*, a hypothetical region containing material beyond recall; that is, inaccessible to the ordinary processes of memory or association and capable of appearing in consciousness only under certain special conditions, such as sleep, hypnotism, free association, and certain pathological states.

(2) Consciousness, then, is not the greater but the restricted and lesser part of the mental life; fore-consciousness, a wider area; and the unconscious, a vastly extended and darkened region inaccessible to the ordinary introspective processes. Briefly, consciousness includes material within awareness; fore-consciousness, material within recall; and the unconscious, material beyond recall.

b. Consciousness.—(1) Consciousness includes all the mental processes concerning which there is awareness, distinct or indistinct, at a given moment; that is, consciousness can only be defined in terms of itself. Thus sensations, ideas, pains, pleasures, acts of memory, imagination, will, etc., are the experiences indicated by the term. These, in their entirety, are what is meant by consciousness. Within the cortex there is a manifestation of some form of energy, not chemical, not electrical, and for a lack of a better term, called "neural" which produces consciousness. This energy manifestation is constant. Never, during life, does complete quiet reign throughout the organism. Always there is a continuous flow of sensations from the organs of the body to the brain; an ebb and flow of neural energy in unified series of physiological tensions. Consciousness, then, may be regarded as the total mass of shifting tensions occurring throughout the cortex at a given moment. When the tension is greatest in the occipital region, there is awareness of visual qualities. When the tension is greatest in the temporal region, consciousness is auditory, etc. Ideational processes occur simultaneously.

(2) In a restricted sense, consciousness obtains whenever physiological processes are converted into psychological. In this element, interruptions occur as in coma and sleep. But in the other element, interruptions never occur while life lasts. The two elements which make up consciousness are as follows:

(a) Epiphenomena, made up for the most part of perceptions of the outer world of reality which disappear from view in the profundity of sleep, as well as in certain other states, and which are erected upon the elements given in (b) below.

(b) Certain permanent phenomena forming the foundation, the continuum of consciousness, made up of a continuous flow of sensations from all the organs of the body to the brain. This flow is constant throughout life and is the continuous, ever present element of consciousness.

c. Fore-consciousness.—This region, containing material capable of ready and spontaneous recall, is not sharply differentiated from consciousness and the material is of a familiar sort.

d. The unconscious.—The unconscious is entirely separated from the fore-conscious and the conscious and contains material so completely repressed and forgotten as to be absolutely unfamiliar. The conception of the unconscious originated with a student of abnormal mental processes, Sigmund Freud. It may be defined as an hypothetical region of the mind, the content of which is repressed mental material. It is that region which constitutes the historical past of the psyche, a region of methods of reaction which have been abandoned for something better as development proceeded. The unconscious is a concept only, a means of explaining psychological and psychopathological facts in psychological terms, for the mental life is explainable only on the assumption that such a region exists.

(1) Three current uses of the term, "the unconscious" are as follows:

(a) It is a synonym for nonmental. This view assumes that no mental process can exist that is not accompanied by consciousness or awareness. On the contrary, most psychopathologists are convinced that processes certainly do occur which present all the attributes of mental ones, except that the subject is not aware of them. According to the latter accepted view, consciousness is merely an attribute of mentality, and not an indispensable one.

(b) It might be called the "limbo" conception, for in it the unconscious is regarded as an obscure region of the mind, the content of which is largely characterized by neglect, oblivion, and decay. It is considered to be a lumber room to which various mental processes become relegated. These processes then become of quite secondary importance having no initiative or dynamic function and remain purely passive.

(c) It is the psycho-analytical conception developed by Freud and his school and is the one presented in this manual. Freud arrived at this conception without a priori speculative hypothesis through the purely inductive method. By technical procedure, he penetrated the region beyond the fore-conscious and investigated those mental processes inaccessible to the patient's direct introspection. In so doing, he uncovered a buried stratum of mind and found himself in a strange mental world, which he named "the unconscious."

(2) The origin, content, and significance of the unconscious are—

(a) *Origin.*—The unconscious has its beginnings in the earliest part of childhood, probably in the first year, and results from the conflict

between the primitive, instinctive, uncivilized tendencies with which the child is born, and the traditional modes of conduct prescribed by the society within which he must live and adjust himself. But since no part of the mental life ever undergoes annihilation, an inhibiting force called "repression," which is forgetting beyond the power to recall, forces the material into that buried stratum of the mind called "the unconscious." This repression takes place without conscious effort. If repression were the result of voluntary effort, it would be unsuccessful; that is, the experience would become fixed in consciousness. Further, the experience which tends to be repressed is the immediately unpleasant and painful without regard for the consequences. Nature takes no account as shown in studies of mental disorders, of the potentialities for future trouble inherent, because the unpleasant or painful experience has merely been buried in the unconscious.

(b) *Content*.—The unconscious is a storehouse of experience associated with instinctive reactions, and as these latter are essentially primitive and infantile in nature, a like coloring is imparted to the unconscious of the whole of life. It is that part of the mental life standing nearest the crude instincts as inborn, and before subjection to the refining influence of education. It is commonly not realized how extensive is the work performed by these influences, nor how violent is the internal conflict they provoke before they finally achieve their aim. Without them, the individual would probably remain a selfish, jealous, impulsive, aggressive, immodest, cruel animal, inconsiderate of the needs of others and unmindful of the complicated social and ethical standards that make up a civilized society. The primitive tendencies must be repressed and the energy diverted into more useful and acceptable channels; it must be sublimated. Yet, according to the findings of psychoanalysis, the results of this refining, sublimating process are rarely so perfect as is generally supposed; because behind the veneer of civilization there remains throughout life a mass of crude, primitive tendencies, always struggling for expression, and toward which the individual tends to relapse whenever suitable opportunity offers. Although experience incompatible with the welfare of the individual is repressed (buried in the unconscious) it does not remain passive; there is active functioning and there is unconscious mentation. The experiences repressed within the unconscious are dynamic in quality and constantly strive to again appear in consciousness. They succeed in overcoming the repressive forces and do appear in dreams, hypnotism, free association, and certain pathological states. It follows that the re-

pressive force must be two-fold in character, on the one hand driving material into the unconscious, and on the other, compelling it to remain there. The latter force is by far the stronger of the two, but neither are invariably successful. Another attribute of the unconscious is that it ignores all logical standards; it is of the emotions, not of the reason. Just as the fantasy oversteps the bounds of time and space, so does the unconscious ignore all reasonable and logical considerations; the primitive and infantile crowd to the fore and demand the right of way. Finally, the unconscious is also sexual in character. Not sexual, however, in the ordinary acceptation of the term, being like other childhood manifestations much more diffuse, tentative, and preliminary in nature. To many psychiatrists the term biological, or creative, is preferred to sexual, as having a broader meaning and more acceptable. Of all the primary instincts, the sexual, in this broader sense, is probably the most active, operates from early childhood, and is subjected to the greatest intensity of repression. The description above may be summarized in a single statement: The unconscious is a region of the mind, the content of which is characterized by the attributes of being repressed, instinctive, primitive, infantile, unreasoning, creative, and dynamic.

(c) *Significance*.—Significance of the unconscious for the psychopathologist may be discussed under four heads:

1. A knowledge of the content and mode of operation of the unconscious furnishes a key for the understanding of numerous morbid manifestations that were previously incomprehensible; it has given a consistent interpretation of them, and has revealed their coherent and intelligible structure. It has furnished proof that an arresting experience, one accompanied by an emotional state of the most poignant kind, can lie dormant and evade the most searching attempt to bring it into consciousness by the ordinary processes of memory. It has further conclusively shown that an experience, though inaccessible to consciousness directly, may yet be capable of affecting it indirectly and with disastrous consequences. Without this knowledge, no solution can be found to such problems as why a given patient has developed this or that particular delusion, phobia, or other symptom; with this knowledge, the bizarre and meaningless which are so familiar in psychopathology disappear or are replaced by other problems.

2. A knowledge of the unconscious makes clear not only the meaning of these symptoms, but their causation as well. They are compromise formations produced through conflict between unconscious and conscious tendencies and are brought about in the following way: Normally a great part of the energy pertaining to the repressed trends of the unconscious is diverted to permissible, socially useful ends by a process known as "sublimation." This denotes a partial renunciation of the crude pleasures obtained by indulging in the primitive tendencies that are kept from consciousness, and a replacement of them by other more or less satisfactory and refined ones. A great number of individuals find it by no means easy to achieve this renunciation, and are in constant danger of relapsing into the old indulgences and gratifications under various circumstances, particularly when the attractions of the more refined aims flag, as they must do whenever the mental environment becomes more painful, difficult, or disagreeable. Then the mental interests and energies are apt to regress toward older and more primitive modes of functioning. This regression, however, is checked by the repressing forces on which the original sublimation depended. In the resulting conflict, neither set of forces is entirely successful; on one hand, the repressing ones manage to prevent a complete return to the primitive modes of gratification, while on the other hand, they fail in transforming the energies in question to sublimated activities. A compromise is reached whereby both sets of forces come to expression, though only in a partial and disguised way; these compromise formations are clinically called symptoms and constitute the various psychopathological maladies. The actual symptoms do not carry their meaning on the surface; they appear symbolically and must be interpreted and translated into the language of the unconscious. This knowledge is necessary of the mechanisms by which the distortion is brought about, that is, by which the latent material is converted into the manifest symptoms.
3. The knowledge gained by investigation of the unconscious bridges over the gap between the normal and the abnormal by demonstrating that similar processes go on

in each, though the control of the one by the other is unequal, the unconscious controlling the conscious to a far greater degree.

4. A knowledge of the unconscious furnishes invaluable aid in the treatment of mental disorders. While treatment has yielded best results in the psychoneuroses, it is hoped that there may be gratifying results in the psychoses as well. The method of treatment is overcoming, by psychoanalysis, the resistances that are interposed against making conscious the repressed complexes, freely exposing them to view, and gaining a much greater control over this pathogenic material by establishing an unobstructed flow of feeling from the deeper to the more superficial layers of the mind. Thus the energies investing the repressed tendencies can be diverted from the production of symptoms into more useful and socially acceptable channels.

5. Definitions of terms.—The following are definitions of certain terms used in paragraph 4.

Consciousness.—In a restricted sense, consciousness obtains whenever there is transformation of physiological into psychical processes. It includes all the mental processes concerning which there is awareness, distinct or indistinct, at a given moment. It is not the greater but the restricted and lesser part of mental life.

Attention.—Attention means the momentary activity of the mind that represents the focal point of consciousness.

Unconsciousness.—Unconsciousness is that condition in which the transformation of physiological into psychical processes is completely suspended.

Fore-consciousness.—Fore-consciousness is that wider region from which material may readily be recalled. It contains entirely familiar material.

The unconscious.—The unconscious is an hypothetical, vastly extended, and highly potential region of the mind containing material beyond recall. It is the historical past of the psyche. Its content is characterized by the attributes of being repressed, instinctive, primitive, infantile, unreasoning, creative, and dynamic.

Conflict.—Conflict is effort at dealing with the discrepancy between desire as represented by instinctive, primitive tendencies and conduct as prescribed by society.

Repression.—Repression is the process by which material is forced into the unconscious and kept there.

Complex.—The complex is a constellation of ideas in the unconscious which have an independent existence and growth, a strong emotional trend, and a tendency to motivate conduct.

Sublimation.—The word "sublimation," borrowed from the terminology of chemistry, was introduced by Freud to denote a psychological process defined by him as "the capacity to exchange an originally sexual aim for another which is no longer sexual, though psychically related." He also defines it as "a process which outlet and application in other regions are opened to overstrong excitations arising from the individual sources of sexuality." By sublimation, the individual sidetracks his disappointment, sublimates the energy of the repressed emotion, and drafts the interest off to higher, more useful, and socially acceptable levels.

Self-consciousness.—Personality has been called the "riddle of psychology." It is the sum total of all the presentations forming the complex idea of the physical and mental self.

Reflex act.—A reflex act is one in which a muscular movement occurs in immediate response to a sensory stimulation without the interposition of consciousness. Consciousness may take cognizance of reflex acts but it does not produce them.

Instincts.—Instincts are racial habits transmitted by heredity to the individual through structurally performed pathways in the nervous system and stand functionally for effective inherited coordinations made in response to environmental demands.

Difference between reflex acts and instincts.—The most suggestive working distinction seems to be found in the presence or absence of some relatively definite though nonconscious end dominating a series of acts. If the motor activity is simple and discharged in response to some objectively present stimulus without conscious guidance, it is safe to call the act a reflex. If the activity involves a number of acts, each one of which considered single and alone is relatively useless but all of which taken together lead up to some adaptive consequence, such as the building of a nest, the feeding of the young, etc., it is safe to call the action instinctive.

Difference between instincts and habits.—Both instincts and habits may be defined as complex systems of reflexes functioning in serial order when the child or adult is confronted by the appropriate stimulus. They differ in that instincts are inherited while habits are acquired.

6. The fundamental problem of life.—The fundamental problem of all life is that of adjustment to environment. The individual

is a little world set in the midst of a larger world. In no sense does he lead an independent existence for his continued welfare depends upon a nicely balanced adjustment between his own inner activities and the conditions of his environment, some of which are beneficial and some harmful. His medium of communication with the environment is the peripheral and effector apparatus of his nervous system. In general, the nervous system performs two groups of functions; the correlation of activities of the several organs of the body among themselves and the physiological adjustment of the body as a whole to the environment, and the higher functions of the cerebral cortex related to the conscious life. The second group cannot be studied apart from the first. The psychiatrist must understand each because mental and physiological processes are inseparably connected. It must be understood that the entire conscious experience depends for its materials upon the content of sense; that is, upon the sensory data received by the peripheral apparatus and transmitted through the lower brain centers to the cortex.

a. The organism establishes and maintains its relations with the environment through the following fields:

- (1) *Psychosensory field*.—Sensorium; perception.
- (2) *Intrapsychic field*.—Intellect; thinking.
- (3) *Psychomotor field*.—Motorium; volition.

b. The physical basis of mind lies in the neural pathways of the cerebral cortex. The functions of these pathways of the cortex are so to regulate and control the actions of the individual as to serve best his interests in his relations with his environment.

(1) Three things are necessary for adjustment:

(a) Experience of the environment must be gained.

(b) This experience must be organized, associated, and brought into relation with previous experience.

(c) The resultant must be transformed into appropriate actions.

(2) The first is brought about through the group of sensory receptors and their pathways to the cortex, collectively called the "sensorium"; the second, by organizing and associating the experiences in the intellect; the third, by discharging the energy through the motorium as motion or glandular activity. In the language of the psychology which considers each of these as faculties of the mind, the function of the sensorium is perception; of the intellect, thinking; and of the motorium, volition.

c. Following are definitions of certain terms used above:

Sensations.—Sensations are the result of stimulation of specialized sensory end organs and comprise the mass of material of which mental functioning is composed.

Perception.—Perception is the process of forming a mental image of an object present to the senses.

Ideation.—Ideation is the process of forming a mental image of an object not then present to the senses. The only difference between percepts and ideas is the presence of sensory elements in the former.

Thinking.—Thinking is the process of assimilating and rearranging materials of knowledge present to the senses with materials already present in consciousness.

Reasoning.—When from the association of two or more ideas there issues a new and different idea, the process is reasoning.

Judgment.—If the reasoning is at all complicated, several judgments usually result, each one tending to express itself in appropriate action. Ziehen calls this conflict of tendencies the "battle motives". The strongest finally succeeds in expressing itself and volition results.

Volition.—Volition is the conscious realization in action of the strongest motive and is accompanied by a sense of freedom to choose which motive shall dominate.

Conduct.—Conduct is the sum total of the actions of the individual. Conduct has social value of the utmost importance because it is the basis upon which the community judges the individual. He may think as he pleases, but he must act along fairly well-defined lines if he expects to be left undisturbed.

d. The problem of adjustment is clearly set forth by one authority as follows: The condition of the baby in its mother's uterus may be described as one of unconditioned omnipotence. Everything is performed for it by its mother and no desires can arise because everything is furnished before the need of it is permitted to exist. At the moment of birth all this is changed. The baby must now breathe for itself, eat for itself, and perform many other functions for itself. Because it is impossible to furnish everything before the need for it exists, desire arises and omnipotence is instantly imperiled. However, the watchful household, intent upon serving the baby, anticipates most of its needs and desires are few. But as the days go by and the baby's sense organs develop and its relations to its environment require more and more complex adjustments, no amount of watchfulness can forestall all of its desires. Consequently, there arises discrepancy between desire and attainment, which discrepancy is ever widening as the years go by and the growing individual touches reality at more and more numerous points. This discrepancy, this conflict between desire and attainment, is at

the very basis of mental life and the fundamental fact of consciousness.

7. Solving of conflict.—*a.* The conflict may be solved in one of two ways; the individual may make things come true by doing them, or he may make things come true by thinking them true; that is, phantasy them. This is expressed as two types of reaction; reality motive and wish fulfillment or pleasure-pain motive.

b. By these reactions the individual, the child, retains the ability to satisfy any desire. Less and less, however, as he grows up he realizes immediate satisfaction of desire, and more and more must there be relinquishment or repression of desire. This process of repression constantly crowds material into the region of the unconscious, that region which constitutes the historical past of the psyche, a region of the greatest interest and importance to the psychiatrist because within it lies buried a mass of material so long since repressed as to be unrecognized when it appears and therefore not understood as a motive for conduct.

c. As the process of development continues with its conflicts, repressions, and ever increasing realm of the unconscious, there come to be three fundamental and controlling groups of desires as follows:

(1) Self-preservation, of which hunger is the type.

(2) Race preservation, of which the sexual relation is the type.

(3) Communal or herd instinct, of which tribal grouping is the primitive type.

d. The libido, interest, or craving is the energy driving toward these three goals. That component driving toward self-preservation is the nutritive libido; that driving toward race preservation is the sexual libido; and that driving toward tribal grouping is the communal libido. Self-preservation, race preservation, and the communal interest are in fundamental conflict. The first implies keeping; the second giving; and the third subordination of self for the welfare of all.

8. Fixation of libido.—*a.* The infant's first interest is in differentiating itself from its environment (auto-erotism). Next the interest goes out indifferently to individuals in its immediate environment, hence to its parents, and as there are male and female, to a differentiation based upon sex. These experiences of love and affection stand as types conditioning all subsequent similar experiences. Then follows drafting of interest wandering of the libido, first in one direction then in another, a characteristic of the young. As the years go by, interest tends to become more and more confined to more definite directions and objects and with maturer years, becomes still further

circumscribed. Increasing restriction of interest is a fundamental characteristic of old age.

b. All mental processes are accompanied by certain physiological processes in the cells and fibers of the cerebral cortex, involving changes in the energy and substance of these cells and fibers. Therefore, when a certain mental process has occurred once, accompanied by its correlative physiological process, the changes in cells and fibers will have left such an impress that a subsequent process of the same sort will occur more rapidly. A mental process having occurred once, tends to recur in the same way when the same conditions are repeated. This tendency is the physiological basis of memory.

c. Memory is the recurrence to consciousness of a previous experience and recognition of it as having occurred before.

d. All mental processes, conscious or unconscious, have, as a super-added mental state, feelings and affections. There is a general tendency on the part of the organism to reach out toward the pleasant and to withdraw from the unpleasant. This is the whole purpose and nature of affection; pleasing things attract and unpleasing things repel the organism. In the scheme of evolution affection is the inevitable sequel to the development of sensation and movement.

e. By affects is meant emotions, passions, moods, and temperaments. The tone of feeling which attaches to a percept, idea, or concept is of a much more complex nature than that which attaches to a simple sensation, and it has many more varieties, known as emotions. An emotion, then, is the pleasant or unpleasant tone of feeling which accompanies sensation. Emotions are also known as feelings compounded of sensations which arise in consequence of complex movements reflexly aroused by the situation (real or imaginary) in which the individual is placed. Each emotion has its corresponding passion and mood, a passion being an intense emotion of short duration and a mood a prolonged emotion of moderate intensity. Closely allied to the moods are the temperaments. A temperament is to be regarded as a mood which lasts the greater part of a person's life. It is an individual's temperament, whether sanguine, pessimistic, or suspicious, which is mainly responsible for the nature of the emotional tone aroused in him by any particular incident.

9. Unconscious emotion.—*a.* When an individual fails to react emotionally to an experience, the emotion is repressed. The reaction not having taken place leaves a certain amount of nervous energy active but ill-directed and unconscious.

b. Every civilized human being has innumerable selfish desires which he is unwilling to admit even to himself; they are therefore

repressed into the unconscious. Whenever a situation or incident tends to arouse an emotion which the subject does not consider he has a moral right to feel, such emotion is repressed into the unconscious and replaced in consciousness by its opposite. Thus, the old maid refuses to admit, even to herself, the slightest trace of sexual passion; it is therefore repressed and converted in consciousness into its opposite, prudery.

c. Another practical point about the psychology of emotion is that it is possible for an effect to remain in consciousness although the situation or idea which gave rise to it has been repressed; the result being that the affect remains unattached, floating free, but ready to attach itself to any or every passing incident; or the affect may become permanently attached to some idea having little association with that which originated the emotion.

d. Affects have a physical basis and depend upon sensations. There is evidence that the thalamic region plays an important role in the development of an emotion reflexly aroused. If a patient has a lesion of one optic thalamus, for example the right, and he hears a joke, he smiles on the right side of the face only; the smile does not occur on the left side. That this paralysis is not due to a lesion of the cortex or pyramidal tract is shown by the fact that the two sides of the face act equally when he assumes a smile. If, on the other hand, the patient has a lesion of the right Rolandic area, he smiles equally on the two sides in response to a joke; but an assumed smile occurs on the right side only, volitional acting being paralyzed on the left side.

e. It follows that mental processes are most intimately connected and not in any sense separate and distinct from each other. Neither barriers nor compartments exist in consciousness; it is a continuum.

f. Finally, mental processes from their incidence in sensations to the release of the motor responses constituting conduct are conceived to have as their physical substratum a continuous neural process.

SECTION III

CAUSES AND NATURE OF MENTAL DISEASE

	Paragraph
General.....	10
Freudian hypothesis.....	11
Adler hypothesis.....	12
Contributing causes of mental disorders.....	13

10. General.—Psychiatry is an important aspect of medicine, as from the psychiatric viewpoint, the individual is regarded as an

entity and not merely the disease is considered. As Ruggles states, "There is no disease or disorder that in some way does not affect the patient's mental and emotional make-up, nor is there any disease or disorder that is not favorably or unfavorably affected by the patient's feeling and thoughts."

a. Mental disorders, excluding those of organic origin, are thought of as failures to effect harmonious adjustments. The symptoms manifested, no matter how grotesque, fantastic, or seemingly inexplicable, are evolved from materials somewhere in the individual's mental past. Nothing is created. Every mental fact has its efficient cause in an antecedent mental state, and every bit of conduct is an end product conditioned by what has gone before and out of which it issues. This is the law of determinism. Thus the symptoms of a psychosis depend for their explanation upon the mental make-up of the individual and the character of his psychic trends, and the form of reaction begins to be understood when his past is uncovered and the history of his development studied.

b. A psychosis, excluding those of organic origin, is the resultant or issue of a conflict. It is the expression on the part of the individual of his type of reaction to the conditions of his environment.

c. In discussing the causes of mental disease, various theories and hypotheses, some of which are as yet only such but which have their value in explaining mental symptoms are confronted, physical causes as well as mental must be considered. Disorders resulting from or accompanied by molecular or physiological changes are known as "physiogenic." To those in which the mental symptoms are due to a psychological reaction to mental events, the term "psychogenic" is applied.

d. The basic factors involved are heredity and environment; by environment is meant the sum of the individual's conditionings and life experiences. How much either of these is a factor cannot be established at the present time. The increasing belief is that heredity has been overemphasized. The reason for this is that terms have been applied loosely, as have statistics. However, it is evident that certain forms of mental diseases do injure the germ cell, producing an inheritance favorable to the development of mental disease. The factor of heredity is still a moot question and knowledge of it is far from complete.

e. The present day opinion is that improper early mental hygiene or improper guidance is the cause of many of the psychologic problems that were generally held to be of hereditary origin. Thus the conclusion which may be drawn is that the symptoms of a

psychosis depend upon the mental make-up of the individual, the character of his mental trends, and his developmental history.

f. The fundamental problem of each individual life is that of adjustment to environment; but the motivating influence is desire. The individual continually strives to satisfy his desires and fulfill his wishes. When these are incompatible with social ideals they must be repressed, and the energy pertaining to them diverted into useful and socially acceptable channels; that is, sublimated. If this is accomplished, the intrapsychic conflict has reached favorable issue and satisfactory adjustment has been made. When like adequate sublimations and adjustments continue throughout life, there is mental health.

g. On the contrary, in numerous instances the intolerable effect of an experience looms too large in consciousness; or a body of experience, a complex, in the unconscious and antagonistic to conscious wishes overrides the repressive forces and disturbs the conscious life. Then sublimation has failed, the intrapsychic conflict causes disharmony, and the individual loses precision of contact with reality; maladjustment obtains in varying measure and there is mental illness which may range in degree from mere worry, through psychoneurotic manifestations, to the frankly psychotic.

h. Based on knowledge of the origin, content, and mode of operation of the unconscious, two well-known hypotheses have been offered in explanation of the causes of mental disorders as well as of the mechanisms bringing about the various symptoms. These are the hypotheses of Freud and Adler. Freud ascribes all to the sexual complex; Adler, to the inferiority complex. Those who accept neither hypothesis urge opposing points of view often so evasive that the student questions the intellectual honesty of the writers and feels that only resistances, conscious or unconscious, block frank acceptance of disputed points.

11. Freudian hypothesis.—*a.* This hypothesis has excited a great deal of acrimonious discussion and much hostile and abusive criticism; partly because the compelling primary instinct of sex is repressed more than any other and its frank discussion absolutely taboo in modern society, and partly because the opposition pushed Freud and his followers to the extreme of explaining practically every phase of human feeling and activity on the sexual basis. It would seem wisest, with unbiased mind, to adopt a compromise viewpoint and deny the sexual instinct primacy in causing mental illness, while conceding it due importance as a causative factor.

b. Freud believes that the tendencies repressed into the unconscious are directed by the pleasure-pain motive to conduct and that the

pleasure sought is of a sexual nature. In the course of development, certain forms of pleasure seeking have received undue emphasis; the child has for some reason continued to derive pleasure from some activity such as nakedness (exhibitionism); sexual curiosity (peeping); inflicting pain on self or others (sodomasochism); pleasure in its own sensations (auto-erotism); love of children most like itself, of the same sex (homosexuality), which should, as a source of pleasure seeking have been relegated to its historic past, and therefore the necessity for deriving pleasure in this way is greater than normal and constantly tends to find expression. Such ways of pleasure seeking are incompatible with the conscious ideals, and so can come to expression only in some disguise. The ways in which these tendencies are satisfied and the disguises they assume produce the symptoms of the psychoses. For example, a homosexual man who cannot bring himself to consciously think of concrete homosexual practices may engage in welfare work among men. The sexual interest is drafted off to a higher, socially accepted and useful level; it is sublimated. When such a man, however, is unable to fully sublimate his homosexual libido, he may take to alcohol because it brings him into the company of men and permits a degree of intimacy under the guise of intoxication that would not otherwise be possible. If his sublimation fails still more completely, he may develop a psychosis with hallucinations of hearing in which the voices accuse him of homosexual practices.

12. **Adler hypothesis.**—*a.* Adler emphasizes the self-preservative rather than the sexual instinct. He sees in the psychosis a conflict due to the desire to dominate which is frustrated by a feeling of inferiority based upon some organic defect. For instance, if the defect is one of speech, the individual feels it his weak point and directs a surplus of energy to overcoming it. If he triumphs, he may become a successful public speaker. Or if he fails to overcome the defect and cherishes the feeling of inferiority, he may break down with a psychosis and show an oversensitiveness concerning the defect with ideas of reference; that is, thinking it is noticed, remarked about, etc. This hypothesis will occur to the student as resting upon a needlessly narrowed basis, only organic defects. If the conception be broadened to include feelings of inferiority and self-depreciation based on any insufficiency, organic, sexual, or otherwise, it immediately assumes deeper significance and lends itself to more general application.

b. Freud and Adler are famous controversialists, and their followers equally so. Their ardor has produced a voluminous literature and two great schools of thought with apparently hopelessly

diverging points of view. On examination, however, their teachings do not appear irreconcilable, for while far apart in some respects, in others they draw rather closely together, and the student finds an acceptable middle ground by broadening the conception of each and minimizing the basic contention.

13. **Contributing causes of mental disorders.**—*a.* The study of a case of mental disorder is a complex problem because the change from the normal usually takes place insidiously; the contributing factors are apt to be multiple; and many of the symptoms incomprehensible, unless the underlying mechanisms be understood.

b. Psychoses are rare until adolescence, at which time the rise is sharp and rapid, continuing until the fourth decade. Then the curve begins to fall, rising slightly again during the involutional period, and again rising during the senium. The marked rise during adolescence is attributed to the physiological and constitutional changes occurring at that period, as well as to the marked increase in conflict resulting from the battle between emotional and instinctive life and the demands made by society. No other period in life demands such an acute change or reorganization of the emotional life. During the involutional period occurs the factor of endocrine "underfunction" and the psychological results arising from the realization that the prime of life has been passed. The highest period of incidence is in the fourth decade and is undoubtedly due to the marked prevalence of general paralysis. The increase during the senium is due to the degeneration changes that occur in the higher cortical neurons at that period of life. Mental disease is more common among the single than among the married. Not because the married live a more stable or regular life, but because the development of mental disease is usually more marked before the age of marriage, and therefore decreases the prospect of marriage. There is no evidence that abstinence of sexual life in itself is a factor in the causation of mental disease from a physiological standpoint; however, from a psychological standpoint, other factors intervene which have their influence on normal mental life. It is no different than that caused by a marriage that does not satisfy the biological and emotional expression of the individuals concerned. It is interesting to note that mental disease is more prevalent among the divorced per unit of population. For example, the rate of first admission in the state of Massachusetts in 1928 was 477 per 100,000 of divorced in the state population compared with 126 single, 88 married, and 201 widowed. The cause is perhaps due to several factors among which may be personality maladjustment leading to psychoses and a fixation at a homosexual development. In other

words, the same mental mechanisms leading to marital maladjustment lead also to an active psychosis.

c. Then there are the psychoses associated with pregnancy, the puerperium, toxemia infection, alcohol, focal infection, chemicals and drugs, endocrine disturbances, physical anomalies, and trauma. These will be further considered in section VII.

d. There is considerable difference in sex distribution in the various psychoses, although approximately an equal number of men and women are admitted to mental hospitals. More men are admitted for the alcoholic psychoses, general paralysis, other syphilitic involvements of the brain, cerebral arteriosclerosis, and schizophrenia. The affective psychoses, neuroses, psychoneuroses, and the psychoses due to somatic disturbances are more frequent among women.

e. As yet no one formulation either chemical, physiological, neurological, or psychological can explain all the phenomena observed in mental disease.

SECTION IV

DYNAMICS OF BEHAVIOR

General	Paragraph
	14

14. General.—*a.* There are two vital forces involved which are characteristic of life; physical life energy and psychic energy. The history of the concept, psychic energy, is interesting. Aristotle called it "horme", Schopenhauer "will", and Freud the sexual definition of "libido." Jung also uses the term "libido", but uses it to designate psychic energy in whatever form. Adler speaks of it as an urge toward superiority, and Jastrow as emotionalized psychic energy. Noyes' definition, perhaps the most practical, is that psychic energy is the sum of the vital energy that motivates the life adjustments of the individual. He further considers it as the result of the expenditure of nervous energy, which must be discussed in psychological terms. He presumes that there is a physico-chemical basis in the relation between psychic and nerve energy, which exists in the Nissl bodies of nerve cells.

b. Most psychiatrists agree that this energy is found in the instincts and manifests itself both potentially and kinetically; psychologically, the instincts are characterized as specific forms of energy. The theory of instinctive behavior is not accepted by those who do not understand biology. They believe that instinctive behavior can be nothing but vile, and do not realize that laudable activities may also result. Prehuman species down through the periods of evolution have efficiently existed by instinctive behavior and it is not for nature

to discard it and create a new principle, which has not been tried, in governing behavior.

c. Some consider behavior to be the result of motive and should be so interpreted. However, motives are but instincts which man has been able to transform and in some measure conceal.

d. The function of consciousness in behavior is that of selection and inhibition, and perhaps creative. On a somewhat similar basis, intelligence determines how the goal of the organism can best be reached.

e. Instincts have been considered from the evolutionary and physical and from the psychological viewpoints. The evolutionary viewpoint describes instincts as inherited directors of energy, while psychologically, they are regarded as urges, drives, or impulses that are utilized for the maintenance of the individual or species, as well as for creative purposes in art, philosophy, and science.

f. Another biomental element which must be considered is emotion. The conception of emotion is determined by the approach to the subject; it depends upon the particular branch of biology used. Several theories are in vogue, such as the James-Lange theory, which considers emotion as a physiological phenomenon. Noyes' definition, as far as psychiatrists are concerned, is that it is the agent that transmutes the potential energy of the organism into psychic energy, and as a feeling-tone that stimulates or facilitates some instinctive tendency, or again as the subjective aspect of instinct experienced when instinctive behavior is obstructed. Physiologically, instincts may be considered as representing the activities of performed or inherited circuits made up of exteroceptors, neurones, and striped muscle fibers, while the emotions represent the auxiliaries of these. The third concept is the psychodynamic agent termed "wish." Freud introduced this term and limited it to sexual longings, especially those that had been repressed. However, it will be considered here as a conscious or unconscious striving on the part of the organism for the release of its inherent energy in forms of instinctive patterns. It is a conveyor of psychic energy. Conscious awareness is not necessary as an essential in this factor, therefore some prefer the term "inclination." Its dynamic energy is exemplified by the attitudes of anger and hate when a wish is frustrated.

g. Dynamic psychology is based on cause and effect in explaining behavior and was made possible by realizing the importance of instincts, emotions, and wishes. Psychiatry is interested in learning how these forces have been misdirected in the abnormal personality.

SECTION V

MENTAL MECHANISMS AND MOTIVES

Paragraph

General..... 15

15. General.—Mental mechanisms and motives are the mental devices, or systems of behavior, with which the individual strives to adapt himself to his environment.

a. Conflict includes the antagonistic tendencies not only of the individual personality, but of those between the individual and the species.

b. The term "suppression" is distinguished from "repression." Suppression is the conscious attempt to forget what it is desired to exclude in contradistinction to repression which is not produced by a deliberate and conscious effort of rejection. A point that we must continually keep before us is that repression is not always pathological nor undesirable, for when repression functions smoothly and without undue effort, the result is a well-adjusted life.

c. A complex is characterized by a strong emotional trend. This emotional trend is termed "affect." It is defined as a feeling-tone that tends to color consciousness and outlook on life. In addition, the affects with their associated conative tendencies constitute an essential and the dynamic element of the complex, that is, the conative tendencies are the driving aspect of the personality or that part of the complex which motivates conduct.

d. Sublimation directs the primitive impulses into other activities which tend to promote the progress or culture of the individual and is one of the most important mechanisms in the formation of sound character. However, in the study of disturbed personality symptoms, it is found that some outstanding personality trait which the individual interprets as a good sublimation is only a neurotic symptom. The transference of energy may be compared to the falls of Niagara. The force of gravity of the falls is the primitive biological energy and the electrical generator is sublimation which acts without apprehending the nature or meaning of the forces it transforms and renders available for utilization.

e. The internal forces cannot be created any more than can the power of gravity, but the motives which are accepted by and are of service to the herd can be selected. This power of selection is termed "conscious control." It is exemplified by the powerhouse switches and controls which direct electricity to its various uses for the benefit of mankind.

f. The distinction given between a lie and rationalization is interesting. The difference between a lie and a rationalization is that in a lie

it is consciously known that the reason is fictitious, whereas rationalization is so thoroughly an unconscious mechanism that it is not realized that the reason assigned is fictitious.

g. Compensation is well illustrated by the comparison of the physiological and physical with the psychological. The compensating heart and compensating scoliosis are examples of the physiological and physical. The compensation of the organism as a whole is illustrated by the individual of small stature with the loud voice and over-bearing manner. These inferiorities may also be of a mental nature, may be real, fancied, and various, and the compensatory reactions may be equally varied. Physical inferiorities may produce outstanding characters such as Steinmetz or Edison. In the field of athletics, great stars are found who were inferior physically at an earlier age. However, all inferiorities do not produce useful compensations. Some compensations which do not result so are seen in the neurotic and psychotic reactions. Compensated physical or mental inferiorities are seen frequently among pilots. The final result which the whole organism seeks is security and a method of asserting its superiority. This superior feeling is at times attained fictitiously, for example, by the recruit who could not assert his superiority in the squad so was driven to assert it fictitiously by assuming the rank of a major general. However, this did not agree with his environment, so he was removed from the group to a hospital.

h. Symbolization is the representation of an idea, quality, or object by another and usually takes the form of symbolic artistry such as painting, sculpture, poetry, and music. These are usually symbolic portrayals of the artistic individual in which he shows his psychological and often psychiatric status, his problems and unconscious tendencies. The expression of the unconscious mind is recognized as being produced through symbols, the indirect product of repression. Ties of any sort are the product of psychogenic origin, being usually disguised expressions of painful mental expressions, or the symbolic representation of consciously disowned trends or desires.

i. Displacement is illustrated by the compulsion "hand-washing." By this mechanism the affect is displaced from a painful complex to one that is apparently unrelated, which is, however, invested with symbolic significance. This symptom frequently appears in the psychotic.

j. Projection is actually the individual's motives ascribed to others. These projections may be either in the form of ideas or perceptions. Ideas project into delusions as illustrated by the "self-inflicted wound" type during the World War. Paranoia illustrates further

the idea-projection mechanism. Hallucinations illustrate the perception type of projection, which is the repressed mental material taking the form of hallucinated voices accusing the patient of practices that represent the rejected aspects. These symptoms commonly are seen in mental institutions.

k. Identification is merely a process of internalization in comparison to projection which is a process of externalization. Identification brings to use the term "introjection," which describes the mechanism involved in incorporating various elements into personality. There are two types of identification. First, the type in which the individual either transfers or attaches to himself certain qualities or properties belonging to other persons or objects, and second, the type in which the individual transfers to one person the representation he has of a second person. The first type of identification has already been discussed. The second type explains why, apparently for some unknown reason, like or dislike of individuals with whom contact is made is explained by identification of these new acquaintances with former acquaintances.

l. Freud's theory of evolution and development of personality is based primarily on the evolution of sex interests. He calls the earliest of these the "auto-erotic" stage. In this stage, primitive sex satisfaction is gained by irritation of different parts of the body, such as the mouth in sucking, and is considered normal at this stage of development. Then the stage of self-consciousness, in which the chief interest is in one's self, and to which Freud gives the term "narcissism." This period is marked by phantasy, self-consciousness, and at times, conceit. The next change is that in which the individual becomes interested in those of his own sex, and is known as the "homosexual" stage. It is seen in early adolescence. Little interest is shown in the opposite sex, in fact a sort of superior air is shown toward the opposite sex. Unless perverted sex practices develop, this stage is normal for the time involved. From this period, the normal stage develops, when the instinctive tendencies trend toward those of the opposite sex. Along with this sex development, there should be a normal development of mental attributes; however, some development may be halted along the time of these different stages which results in incompletely matured element or an inharmonious integration. This halting of development prior to complete maturity is known as "fixation." The simile in physical life is that of the blood circulation in the fetal heart. If the foramen ovale does not close, there is a halt in the maturing of the infant, which condition is, however, normal in the intra-uterine development. One conception of fixation explains many of the symptoms seen in border-line

and frank psychoses. A fixation at the homosexual level is a good example. This level is maintained by the individual either through this stage of development becoming attractive, or through a constitutional or biological defect in the sexual characteristic. The herd rejects these tendencies as they are contrary to biological law, therefore a conflict is established between the individual and the herd, and various psychopathological phenomena are developed.

m. The personality may lose some of the development it has already attained. The mechanism involved has been termed "regression." It is an adjustive mechanism, but adjusts to a lower level and therefore abnormal. It is illustrated by those who when physically ill become irritable, defendant, and childish. It is but a reversion to a lower stage of development; to an infantile or primitive behavior. Where regression occurs, the personality does not return to its previous identity on removal of the regression.

n. If the effect that mental factors have in physical processes are not recognized, neither are the exaggerations caused thereby. The vegetative nervous system is influenced by mental conflicts and emotions, and a functional disturbance results therefrom. An organic disturbance may be initiated and disturbances already present are enlarged.

SECTION VI

PSYCHOBIOLOGICAL CONSTITUTION AND REACTION TYPES

	Paragraph
General.....	16
Classification.....	17

16. General.—In the psychobiological constitutions, the problem of the relation between human form and human nature, or a branching out with the general problem of the correlations between physical form and psychic nature are considered. It is rather an empirical investigation, but it is a grouping of humanity into types and is important to the psychiatrist and to all interested in psychology. When the common conceptions of various characters, either mythological or true, are portrayed, the devil is usually lean with a thin beard growing on a narrow chin; the intriguer has a hunch back and a slight cough; the old witch has a withered hawk-like face; the gangster has a sullen, piercing, antagonistic, hard look. Where there is brightness, jollity, and good-fellowship, the fat individual with the red nose and bald, shining pate is seen. Saints look abnormally lanky, pale, long-limbed, of penetrating vision and godly. These conclu-

sions are probably objective findings of folk psychology, the results of the observations of mankind.

17. *Classification.*—*a.* The anthropological types which Kretschmer has called attention to are the pyknic, asthenic or leptosome, athletic, and dysplastic. With these he associated different types of temperament and classified temperament into the cyclothymic, and schizothymic or schizoid. The cyclothymic temperament is subdivided into the hypomanic, syntonetic, and melancholy types. This classification involves the physique and temperament of the individual. Another classification of reaction types involves the form and direction of energy trends. This classification is devised by Jung and divides this form and direction of energy trends into two reaction types which he called "extroversion" and "introversion." These divisions are as follows:

(1) *Anthropological.*

(a) Pyknic.

(b) Asthenic or leptosome.

(c) Athletic.

(d) Dysplastic.

(2) *Temperamental.*

(a) Cyclothymic.

1. Hypomania.

2. Syntonetic.

3. Melancholia.

(b) Schizothymic or schizoid.

(3) *Direction of energy trends.*

(a) Extroversion.

(b) Introversion.

b. The pyknic type is characterized by the pronounced development of the head, breast, and stomach, and a tendency to a distribution of fat about the trunk with a more graceful construction of the shoulders and extremities. An individual of middle height, rounded figure, soft broad face on short thick neck, and a fat paunch protruding from a deep vaulted chest which broadens out toward the lower part of the body.

c. In the asthenic type we find a general deficiency in thickness without a corresponding lessening in length. This deficiency in thickness development is present throughout all parts of the body.

d. The male athletic type is recognized by the strong development of the skeleton, musculature, and skin. He is middle-sized to tall, with a well-formed chest, firm stomach, and a trunk which tapers in its lower region, well-shaped pelvis, and strong limbs.

e. In the dysplastic type are placed all aberrations, and here are classified the biological inverts. The special groups which are recognized as dysplastic are such as the myxedematous, infantile, eunuchoid, and masculinism in women.

f. The above classification is devised for more accurate study, especially as to their relation to character; and many variations will occur. The cranium itself is not important in its relation to the brain; it is only a detail in the formation of the entire body. Any morphological characteristic must be regarded as being important only as part of the framework of the bodily constitution. The size and shape of the skull does not reveal what it contains. Psychic disorders are not brain disorders, they involve the whole physiological development.

g. The cyclothymic, or the manic-depressive, is associated with the pyknic type. In the schizoid, there is a marked preponderance of the asthenic, athletic, and dysplastic types. There seems to be a clear biological affinity between the psychic disposition of the manic-depressive and the pyknic body type; a clear biological affinity between the psychic disposition of the schizoids and the bodily disposition characteristic of the asthenics, athletics, and certain dysplastics. The cycloid or cyclothymic, on the average, is the good-natured, sociable, friendly, realistic individual. In all his reactions and expressions, the personality tends to function as a unit. He is friendly, well-liked, rarely grumbles, has a sense of humor, and enjoys a joke. However, he is rather easily moved to tears. He has a soft temperament which can swing to great extremes; that is, mood and tempo harmonize. He easily oscillates, therefore the name cycloid. These oscillations have been classified again with the hypomanic, syntonetic, and melancholic groups, depending upon the prevalent reaction. The temperament of the cycloid alternates between cheerfulness and sadness in what may be described as deep rounded curves. The syntonetic is the average, normal cyclothyme, the hypomanic is on the upper curve, the melancholic on the lower. The hypomanic is flighty with a tendency to be carried away, confident, aggressive, but has a superficial judgment and a ready excuse for his failures. The melancholics are at the opposite extreme. The cycloid is a somewhat uncomplicated being whose feelings rise directly, naturally, and undisguised to the surface, so that a correct judgment of them may soon be formed. On the contrary, the schizoid has a surface and depth; he is a question mark. There are schizoids, men and women alike, with whom constant contact may be had for years, and yet their feelings may remain unknown; sometimes even to themselves. Bleuler calls it "autism," the living inside one's self. Reality never seems to have a normal value, and he elaborates things in phantasy. He shows the contrasting qualities of sensitiveness and

lack of affective sensibility, in contrast to the cycloid who shows the contrasting qualities of cheerfulness and melancholia. The cycloids and schizoids have nothing to do with the question of being pathological or healthy. They are large, general biological types which include the great mass of healthy individuals, with the corresponding psychotics scattered among them. The cycloids must not necessarily be manic-depressives, nor the schizoids schizophrenics.

h. Extroversion and introversion depend on psychobiological energy. All individuals possess both mechanisms, and only the relative predominance of one or the other determines the type. This in itself is difficult to determine, because the psychological reaction of the human being is such a complicated matter. However, this line of demarcation may be made: In introversion, there is fundamentally an outward movement of interest toward the object, and in extroversion there is a movement of interest away from the object as regards the individual and his psychological processes. Introverts are compensating and extroverts compensating, with the result being a combination of both, which adds to the difficulty of classification. However, it is a method of differentiation of extensive groups of psychological individuals. The disguised behavior is of interest in psychiatry. As a further step in the study of extroversion and introversion, it is noted that a rhythmical alteration of both forms of psychic activity may correspond with the normal course of life; but the complicated external conditions under which we live, as well as the presumably even more complex conditions of individual psychic disposition, seldom permit an undisturbed flow of psychic activity. Jung, who introduced the psychological conceptions extroversion and introversion, further added the basic psychological functions of thinking, feeling, sensation, and intuition, and made up types according to these functions, and stated also that everyone of these types could be extroverted or introverted. The terms "extroverted" and "introverted" were used by Jung to describe what he called "general attitude types," and the special types which he based on thinking, feeling, sensation, and intuition, called "function types." The extroverted thinking type belongs to that group, if it can be shown that the ideas with which they are engaged are to a great extent borrowed from without. They are not what is termed "original thinkers." Therefore they fall into the following classification:

(1) *Extroversion.*

Extroverted thinking type.
Extroverted feeling type.
Extroverted sensation type.
Extroverted intuitive type.

(2) *Introversion.*

Introverted thinking type.
Introverted feeling type.
Introverted sensation type.
Introverted intuitive type.

This manual is limited to classifying examinees in the two great classes of introverts and extroverts. However, it is found that besides the conscious main function there is also a relatively unconscious auxiliary function and applicants should be classified into these various groups, even though the larger groups only are required.

SECTION VII

CLASSIFICATION OF MENTAL DISORDERS

	Paragraph
Use of term "insanity".....	18
Point of view in studying cases.....	19
Psychosis.....	20
Classification of the psychoses.....	21

18. Use of term "insanity."—Insanity is not a disease and the word should not be used as a medical term. It is solely a legal and sociological concept used to designate those members of society who are so far unable to adjust themselves to the ordinary social requirements that the community segregates them. "Insane" simply means "certifiable" in a legal sense.

19. Point of view in studying cases.—*a.* It must be determined whether the disorder is organic or psychogenic. Study must be made of the life history of the individual. There must be comprehension of the—

(1) Character make-up or trend; as the unstable, hysterical, unresistive, etc.

(2) Nature of the etiological factors,

(3) Mechanism of the reaction.

b. The type of reaction can only reach its explanation in the type of person displaying it. The important consideration is an understanding of the individual, not a labeling of the psychosis.

20. Psychosis.—A psychosis, excluding those of organic origin, is the pathological resultant of a conflict, exhibiting itself in social behavior. From the standpoint of disordered mental functioning, it is the expression on the part of the individual of his type of reaction to the conditions of his environment.

21. Classification of the psychoses.—Present knowledge of the psychoses does not warrant attempts at permanent classification. Those classifications in use are therefore tentative and subject to change and modification. The tendency in classification is away from concrete, definite entities and toward the use of terms indicating symptom grouping; as, Schizophrenic group, manic-depressive group, paranoid group, psychoneurotic group, etc.

a. With these considerations in mind, and also that other classifications are in use, the following list approved by the Council of the American Psychiatric Association, compiled by the National Conference on Nomenclature of Disease, and published by the Commonwealth Fund, 1935, is given below:

- (1) *Psychoses due to or associated with infection.*
 - (a) Psychoses with syphilis of the central nervous system.
 1. Meningo-encephalitis type (general paresis).
 2. Meningo-vascular type (cerebral syphilis).
 3. Psychoses with intracranial gumma.
 4. Other types (to be specified).
 - (b) Psychoses with tuberculous meningitis.
 - (c) Psychoses with meningitis.
 - (d) Psychoses with epidemic encephalitis.
 - (e) Psychoses with acute chorea.
 - (f) Psychoses with other infectious disease (to be specified).
 - (g) Postinfectious psychoses (infection to be specified).
- (2) *Psychoses due to intoxication.*
 - (a) Psychoses due to alcohol.
 1. Pathological intoxication.
 2. Delirium tremens.
 3. Korsakow's psychosis.
 4. Acute hallucinosis.
 5. Other types (to be specified).
 - (b) Psychoses due to drugs or other exogenous poisons.
 1. Psychoses due to metals (to be specified).
 2. Psychoses due to gases (to be specified).
 3. Psychoses due to opium and derivatives.
 4. Psychoses due to other drugs (to be specified).
- (3) *Psychoses due to trauma (traumatic psychoses).*
 - (a) Traumatic delirium.
 - (b) Post traumatic personality disorders.
 - (c) Post traumatic mental deterioration.
 - (d) Other types (to be specified).
- (4) *Psychoses due to disturbance of circulation.*
 - (a) Psychoses with cerebral embolism.
 - (b) Psychoses with cerebral arteriosclerosis.
 - (c) Psychoses with cardio-renal disease.
 - (d) Other types (to be specified).
- (5) *Psychoses due to convulsive disorders (epilepsy).*
 - (a) Epileptic deterioration.
 - (b) Epileptic clouded states.

- (c) Other epileptic types.
- (6) *Psychoses due to disturbances of metabolism, growth, nutrition, or endocrine function.*
 - (a) Senile psychoses.
 - 1. Simple deterioration.
 - 2. Presbyophrenic type.
 - 3. Delirious and confused types.
 - 4. Depressed and agitated types.
 - 5. Paranoid types.
 - (b) Alzheimer's disease.
 - (c) Involutional psychoses.
 - 1. Melancholia.
 - 2. Paranoid types.
 - 3. Other types (to be specified).
 - (d) Psychoses with diseases of the endocrine glands (to be specified).
 - (e) Exhaustion delirium.
 - (f) Psychoses with pellagra.
 - (g) Psychoses with other somatic diseases (to be specified).
 - (7) *Psychoses due to new growth.*
 - (a) Psychoses with intracranial neoplasms.
 - (b) Psychoses with other neoplasms.
 - (8) *Psychoses due to unknown or hereditary causes, but associated with organic changes.*
 - (a) Psychoses with multiple sclerosis.
 - (b) Psychoses with paralysis agitans.
 - (c) Psychoses with Huntington's chorea.
 - (d) Psychoses with other brain or nervous disease (to be specified).
 - (9) *Disorders of psychogenic origin or without clearly defined tangible cause or structural change.*
 - (a) Manic-depressive psychoses.
 - 1. Manic type.
 - 2. Depressive type.
 - 3. Circular type.
 - 4. Mixed type.
 - 5. Perplexed type.
 - 6. Stuporous type.
 - 7. Other types.
 - (b) Dementia praecox (Schizophrenia).
 - 1. Simple type.
 - 2. Hebephrenic type.
 - 3. Catatonic type.

4. Paranoid type.

5. Other types.

- (c) Paranoia.
- (d) Paranoid conditions.
- (e) Psychoses with psychopathic personality.
- (f) Psychoses with mental deficiency.
- (10) *Psychoneuroses (hysteria)*.
- (a) Anxiety hysteria.
- (b) Conversion hysteria.
- (c) Anesthetic type (indicate symptomatic manifestations).
- (d) Paralytic type (indicate symptomatic manifestations).
- (e) Hyperkinetic type (indicate symptomatic manifestations).
- (f) Paresthetic type (indicate symptomatic manifestations).
- (g) Autonomic type (indicate symptomatic manifestations).
- (h) Amnesic type (indicate symptomatic manifestations).
- (i) Mixed hysterical psychoneurosis (indicate symptomatic combinations by using the various symptoms in the categories given above).
- (11) *Psychasthenia or compulsive states*.
- (a) Obsession (indicate symptomatic manifestations).
- (b) Compulsive tics and spasms (indicate symptomatic manifestations).
- (c) Phobia (indicate symptomatic manifestations).
- (d) Mixed compulsive states (indicate symptomatic combinations by using the various symptoms in the categories given above).
- (12) *Neurasthenia*.
- (13) *Hypochondriasis*.
- (14) *Reactive depression (simple situational reaction, others)*.
- (15) *Anxiety state*.
- (16) *Mixed psychoneurosis* (indicate symptomatic combinations by using the various symptoms given above).
- (17) *Undiagnosed psychoses*.
- (18) *Without psychosis*.—(This diagnosis is to be used only in psychiatric and psychopathic hospitals where it is required to account for patients submitted for observation or allowed to remain in hospital for other legitimate reason).
- (19) *Epilepsy*.
- (20) *Alcoholism*.
- (21) *Drug addiction*.
- (22) *Mental deficiency*.
- (23) *Disorders of personality due to epidemic encephalitis*.
- (24) *Psychopathic personality*.
- (a) With pathological sexuality (indicate symptomatic manifestations).

(b) With pathological emotionality (indicate symptomatic manifestations).

(c) With asocial or amoral trends (indicate symptomatic manifestations).

(d) Mixed types (indicate symptomatic manifestations by using the various symptoms in the categories given above).

(e) Other nonpsychotic diseases or conditions (to be specified).

(25) *Primary behavior disorders*.—Simple adult maladjustment.

(26) *Primary behavior disorders in children*.

(a) Habit disturbance (indicate symptomatic manifestations).

(b) Conduct disturbance (indicate symptomatic manifestations).

(c) Neurotic traits (indicate symptomatic manifestations).

b. The following is also listed as involving the "Psychobiological unit":

(1) *Due to prenatal (constitutional) influences*.

(a) Familial mental deficiency.

(b) Mongolism.

(c) Mental deficiency with developmental cranial anomalies.

(d) Mental deficiency with congenital cerebral spastic infantile paraplegia.

(2) *Due to infection (lower forms)*.—Post infectious mental deficiency.

(3) *Due to trauma*.

(a) Post traumatic mental deficiency, natal.

(b) Post traumatic mental deficiency, post-natal.

(4) *Due to convulsive disorders*.—Mental deficiency due to epilepsy.

(5) *Due to disturbances in metabolism, growth, or nutrition*.

(a) Mental deficiency with endocrine disorders.

(b) Mental deficiency with familial amaurosis.

(6) *Due to new growths*.—Mental deficiency with tuberous sclerosis.

(7) *Due to causes determinable in the particular case*.—Mental deficiency, cause undiagnosed.

(8) *Diseases due to prenatal influences*.

(a) Prematurity (to be used only in the case of infants admitted after birth).

(b) Congenital hypothyroidism.

(9) *Diseases due to intoxication*.—Drug addiction (specify drug).

(a) Alcohol addiction.

(b) Alcohol addiction, periodic.

(c) Ether addiction.

(d) Chloroform addiction.

- (e) Absinthe addiction.
- (f) Cannabis addiction.
- (g) Cocaine addiction.
- (h) Nicotine addiction.
- (i) Opium (morphine, heroin) addiction.
- (10) *Diseases due to disturbances of innervation or of psychic control.*—Hypertonicity of infancy.
- (11) *Diseases due to disorders of metabolism, growth, or nutrition.*
 - (a) Infantilism.
 - (b) Precocity.
 - (c) Premature puberty.
 - (d) Menopause syndrome.
 - (e) Premature menopause.
 - (f) Senility.
 - (g) Pseudocyesia.

SECTION VIII

SYMPTOMS OF MENTAL DISEASE

	Paragraph
Classification.....	22
Disorders of perception.....	23
Disorders of content of thought.....	24
Disorders of train of thought.....	25
Disorders of volition (action).....	26
Disorders of emotion (affectivity, feeling).....	27
Disorders of memory.....	28
Disorders of attention.....	29
Disorders of personality (disturbances of self-consciousness).....	30
The complex.....	31
Dreams.....	32

22. Classification.—The general symptoms of the psychoses fall into eight classifications; these classifications with their subdivisions are as follows:

- a. Disorders of perception, comprising—
 - (1) Illusion (inaccurate perceptions).
 - (2) Hallucination (perceptions without an object).
 - (3) Pseudo-hallucinations.
 - (4) Hypnagogic hallucinations.
 - (5) Auditory hallucinations.
 - (6) Visual hallucinations.
 - (7) Hallucinations of taste and smell.
 - (8) Haptic hallucinations.
 - (9) Hallucinations of the organic sensations.
 - (10) Kinesthetic or motor hallucinations.

- (11) Reflex hallucinations.
- (12) Clouding of consciousness (insufficiency of perception).
- (13) Dream states.
- (14) Disorientation.

b. Disorders of content of thought (judgment)—

- (1) Delusion.
- (2) Hyper-quantivalent ideas.
- (3) Fixed ideas.
- (4) Obsessions.
- (5) Autochthonous ideas.

c. Disorders of train of thought—

- (1) Flight of ideas.
- (2) Circumstantiality.
- (3) Retardation.
- (4) Paralysis of thought.

d. Disorders of volition (action)—

- (1) Decreased psychomotor activity.
- (2) Increased psychomotor activity.
- (3) Impulsion.
- (4) Compulsion.
- (5) Stereotypy.
- (6) Negativism.
- (7) Suggestibility.
- (8) Stupor.

e. Disorders of emotion (feeling, affectivity)—

- (1) Exaltation.
- (2) Depression.
- (3) Emotional deterioration.
- (4) Morbid anger.

f. Disorders of memory—

- (1) Amnesia.
- (2) Hyperamnesia.
- (3) Paramnesia.

g. Disorders of attention—

- (1) Aproxia.
- (2) Hyperproxia.

h. Disorders of personality—

- (1) Depersonalization.
- (2) Splitting of personality.
- (3) Multiple personality.
- (4) Transformation of personality.

23. Disorders of perception.—a. Illusion.—An illusion is a false perception of an object. It is a perception which alters the qualities of

the object perceived and presents it to the consciousness in a form other than the real one. The distinguishing feature of an illusion is that an actual something in the environment is perceived but the perception is incorrect and conveys false information to the mind; thus a strap on the floor may be perceived as a snake, the sighing of the wind as a whispering voice, a bad taste as poison, and so on throughout the different sensory realms.

b. Hallucination.—An hallucination is a perception without an object. The distinguishing feature of an hallucination is a perception without there being anything in the environment to perceive. Thus a strap is perceived on the floor when the floor is bare. The content of the hallucination is never newly created mental material, but is made up of memory pictures. The congenitally blind never have visual hallucinations; the congenitally deaf never have auditory hallucinations; they may, however, occur in acquired blindness and deafness. In practical use, it is not customary to distinguish between illusion and hallucination, the term "hallucination" being understood to include the phenomena of illusion.

c. Pseudo-hallucinations.—These occupy a position midway between fully developed hallucinations and imagination, having an objective reality less than the former and greater than the latter. Imaginative processes do not occur independently of volition as do hallucinations and pseudo-hallucinations. In hallucinations, the perceived object not only seems external and real, but there is no suspicion that the object seen or heard is not actually real and present. In pseudo-hallucinations there is a background of consciousness which assures the victim that the phenomena is after all imaginary and unreal despite its genuinely objective appearance. Thus a patient had a pseudo-hallucination of a lion which appeared to him and laid its forepaws on his shoulders, but he appreciated that he saw the lion only with his mind's eye and was not afraid as he would otherwise have been; he merely interpreted the phenomena as signifying his allegiance to England.

d. Hypnagogic hallucinations.—These are hallucinations occurring in the intermediate state between sleeping and waking. They may readily be mistaken for genuine hallucinations.

e. Auditory hallucinations.—These are more common than visual hallucinations. The "voices" may say pleasant or unpleasant things, but disagreeable things are usually heard. Voices may be heard in one ear or both ears and may be of any timber. Rarely one voice, as of Christ, is heard in one ear and another, as of the devil, is heard in the other. The voices may be located externally or as coming from the different parts of the body, as the "epigastric voice," the "pelvic

voice," etc. More obscurely there may be complaint that the thoughts become audible; the patient hears them before speaking them.

f. Visual hallucinations.—These range all the way from mere flashes of light, sparks, colors, to the most complex visions. Hallucinations of sight are more apt to be pleasant than those of hearing, but may also be disagreeable, even terrifying.

g. Hallucinations of taste and smell.—These are apt to be associated and are almost uniformly disagreeable.

h. Haptic hallucinations.—These are hallucinations associated with the special senses located in the skin; touch, pain, heat, cold. The parasthesias come within this class of hallucinations.

i. Hallucinations of the organic sensations.—These are peculiar and often indescribable sensations coming from the internal organs and giving rise to such beliefs as the bones are broken, the brain dried up, the bowels stopped, that a woman has been violated in her sleep, or that a man has had his semen drawn off while he slept.

j. Kinesthetic or motor hallucinations.—These are sensations coming from the muscles, tendons, or joints and giving rise to a belief that the body has undergone a change in position. Thus a woman may complain that men remove her from bed at night, carry her away, violate her, and return her to her bed.

k. Reflex hallucinations.—These are based on secondary sensations arising in one sensory field when the stimulus has been applied in another field.

l. Clouding of consciousness.—The process of perception is dependent upon sensations coming from without. Stimuli, in order to cross the threshold of consciousness, must have a certain force (threshold value) in order to fix attention and occupy the focal point of consciousness. Stimuli not reaching the focal point of consciousness have a marginal value only; their threshold value is too low to fix attention. When ordinary and even unusual stimuli fail to fix attention, consciousness is said to be clouded; a condition representing a fundamental element of many of the psychoses.

m. Dream states.—These differ from the normal dream because in the latter, psychomotor reactions occur corresponding to the content of consciousness. In dream states, there is a slight clouding so that ordinary stimuli fail to reach consciousness, the patient being oblivious of his surroundings while the mind is occupied by dreamy ideas and multiform hallucinations.

n. Disorientation.—This indicates lack of apprehension of the temporal, spatial, and personal aspects of the environment, either singly or together. Temporal disorientation indicates failure to apprehend time relations; spatial disorientation indicates failure to

apprehend relations in space; personal disorientation indicates failure to apprehend identity of self as well as others.

24. Disorders of content of thought.—*a. Delusion.*—(1) A delusion is a false belief, but it is not necessarily evidence of psychosis. It may be without pathological significance. For example, a man may believe today is Thursday when in fact it is Friday, a false belief while it lasts but having only the significance of a mistake.

(2) Delusions present three main characteristics: First, they are not true to facts, highly improbable, even manifestly impossible; second, they cannot be corrected by an appeal to reason; third, they are out of harmony with the education and surroundings. A sick Fijian crying for his soul to return to his body but exemplifies the Fijian belief that sickness is due to the soul, or a part of it, leaving the body; should an American who had received the customary instruction and training act similarly, there would be reason for considering him unbalanced.

(3) Delusions are classified as systematized and unsystematized. A systematized delusion is so firmly established that it motivates conduct and the patient's whole life becomes centered about and secondary to it. Thus the patient who believes all his bones are broken and lies in bed because of this belief has a systematized delusion.

(4) An unsystematized delusion exercises no special control over the patient's conduct. Thus a patient who believes all his bones are broken, but goes about his affairs as usual, has an unsystematized delusion.

b. Hyper-quantivalent ideas.—These will not be discussed here because the term "fixed idea" is sufficiently inclusive.

c. Fixed ideas.—A fixed idea is an idea which attains a degree of importance altogether unwarranted. Fixed ideas are felt to be the outgrowth or reaction of the normal self and not in any way abnormal or an obtrusion from without as are obsessions and autochthonous ideas.

d. Obsessions.—By obsessions is meant ideas, emotion, and impulses which occupy consciousness persistently and irrespective of the desires of the subject, often intruding themselves at inopportune times and occupying the field of consciousness to the exclusion of other ideas. Obsessions are felt to come from without and are often comprehended at their full value. They are often spoken of as besetments, and include the phobias or fears, as agoraphobia (fear of wide or open spaces), claustrophobia (fear of narrow or closed spaces), etc., and the doubts. For example, a person after going to bed is obsessed with doubt as to whether he turned the gas cock quite shut or put the cat out of doors. He tries to banish the doubt.

but finally in desperation he rises, satisfies himself he has done these things, returns to bed, and presently falls asleep. Of graver import than these trivial doubts are those concerning religious and metaphysical matters. These latter doubts (obsessions) may achieve a dignity and importance ultimately motivating conduct, in which event they are known as imperative ideas or imperative concepts.

e. Autochthonous ideas.—These are thoughts the patient feels to be strange thoughts, not his own, and interprets them as coming from without and due to the malevolence of enemies. When acting upon these usually bad thoughts, he protests he dislikes acting thus and that it is against his will.

25. Disorders of train of thought.—*a. Flight of ideas.*—In normal thinking, the thought progresses steadily toward an end known as the goal idea. In flight of ideas, the train of thought changes direction frequently, the goal idea is lost sight of, and the thought wanders here and there under the influence of chance association; that is, the element of distractibility dominates the goal idea and the goal idea is never reached.

b. Circumstantiality.—This superficially resembles flight of ideas but in reality is totally different. Although the train of thought changes direction frequently, the goal idea is maintained and ultimately reached, notwithstanding much circumlocution and narration of wearisome but nevertheless related details. In moderately developed form, circumstantiality is often encountered and has no special significance other than showing a lack of appreciation of the relative value of ideas.

c. Retardation.—This is well expressed by the term “difficulty of thinking.” There is a decided slowness in the elaboration of ideas. Ideas come slowly, there is difficulty in forming judgments, in coming to conclusions, and in making decisions. The patient speaks very slowly and the retardation may be initiative or executive, or both. Thus a patient to count from 1 to 20 may be a long time beginning (initial retardation) and a long time in concluding (executive retardation).

d. Paralysis of thought.—This is complete absence of all internally initiated conscious processes. Mental life is in abeyance or abolished.

26. Disorders of volition (action).—*a. Decreased psychomotor activity.*—This symptom corresponds in the motor sphere to retardation in the psychic sphere and might aptly be called psychomotor retardation. Whereas in retardation there is slowness in the elaboration of ideas, in decreased psychomotor activity there is slowness in the liberation of voluntary motor responses. The patient moves slowly and deliberately and there is an initial and executive distinc-

tion as in retardation. Decreased psychomotor activity is a prominent symptom of melancholia.

b. Increased psychomotor activity.—This symptom is just the opposite of decreased psychomotor activity. There is an abnormally facile release of voluntary motor impulses. However, the restlessness, activity, violence, and destructiveness are entirely without purposeful direction because distractibility controls as in flight of ideas. Increased psychomotor activity is a prominent symptom of the manic phase of manic-depressive psychosis.

c. Impulsion.—Impulsions or impulses are tendencies to act which are more or less uncontrollable, often absolutely so. This classification includes the manias as kleptomania (a morbid impulse to steal), pyromania (a morbid impulse to set things on fire), a dipsomania (a morbid impulse to drink), etc.

d. Compulsion.—This is felt to be an extraneous influence often forcing the commission of an act repugnant or even abhorrent to the individual. The patient may take elaborate precautions to protect others from his compulsive acts, even having himself locked up. If impulsions are resisted or interfered with, they give rise to symptoms in marked cases constituting a veritable crisis. The patient feels weak, trembles, becomes dizzy, perspires, but finds all these symptoms promptly disappearing on yielding to the compulsion.

e. Stereotype.—In this condition, the voluntary impulse once set in motion tends to repeat itself in the same way indefinitely. There are three forms; stereotypy of attitude, of movement, and of speech. In stereotypy of attitude, the patient tends to maintain some peculiar position, such as lying on the bed with the head hanging over the side; in stereotypy of movement, the patient repeats some meaningless movement such as swaying back and forth, nodding, etc., when such peculiarities are constant and characteristic of the ordinary conduct, they are called mannerisms; in stereotypy of speech, there is constant repetition of senseless phrases commonly called verbigeration. Persistence of a motor impulse, whether in action, speech, or writing is called perseveration.

f. Negativism.—This condition presents a three-fold aspect. The patient does not do as directed; does nothing (passive negativism); does the opposite of what he is directed (active negativism); or exhibits negativistic tendencies toward the prompting of normal desires. Thus he refuses to empty the bladder or rectum or retains saliva until it undergoes putrefactive changes.

g. Suggestibility.—This condition is the exact opposite of negativism. The patient's reactions are determined by suggestions or im-

pressions derived from others. Suggestibility is manifested in various ways; by repeating words or phrases used by others (echolalia), by repeating the actions of others (echopraxia); by a condition in which the limbs can be placed in any position as in catalepsy or *flexibilitas cerea* (flexibility); by reactions devoid of all personal initiative (automatism). When the automatic responses are to commands, the condition is termed automatism.

h. Stupor.—In this condition consciousness is profoundly disturbed; when completely established, stimuli are not perceived.

27. Disorders of emotion (affectivity, feeling).—*a. Exaltation.*—This is a condition of emotional elation, a feeling of happiness and well-being not warranted by the patient's condition or surroundings. It is a prominent symptom of mania.

b. Depression.—This is a feeling not warranted by the patient's condition or surroundings. It is a prominent symptom of melancholia.

c. Emotional deterioration.—A condition of poverty of the emotions manifesting itself by indifference. It occurs in mental deterioration, and is seen in dementia praecox, paresis and senility.

d. Morbid anger.—This symptom is seen most often in defectives, being a marked feature in idiots and imbeciles.

28. Disorders of memory.—*a. Amnesia.*—Memory is the recurrence to consciousness of a previous experience and recognition of it as having occurred before. The loss of memory is called amnesia. When the loss covers a period with a definite beginning and definite ending, it is called anterograde amnesia.

b. Hyperamnesia.—This is an exaggerated degree of retentiveness. The condition is often seen in a chronic delusional psychosis, the patient seeming to remember every detail of his life bearing on his delusional system.

c. Paramnesia.—In this condition, there is a mixture of invention and real experience. The gaps resulting from disordered perception are filled with fabrications; the patient without awareness thus making good his memory lapses.

29. Disorders of attention.—*a. Aproxevia.*—In this condition there is inability to fix the attention for any length of time in one direction. Consequently perception is inadequate—not clear—mistakes occur, indeed stimuli may not be perceived at all. In this way disorientation may occur—as to persons, for instance, because the wandering attention notes some slight resemblance but is not fixed long enough for recognition of actual identity. Inability to fix the atten-

tion—enfeeblement of the power of voluntary attention—is one of the most fundamental signs of mental deterioration.

b. Hyperosæia.—In this condition the attention of the patient is completely absorbed by some thoughts, usually his delusions. This absorption may be so complete that no attention whatever is paid to the environment. Perception would, of course, be very inadequate.

30. Disorders of personality (disturbances of self-consciousness).—Personality, or self-consciousness, is the sum total of all the presentations forming the complex idea of the physical and mental self. The four disturbances of self-consciousness all result from an intrapsychic conflict. The differences are in degree only. In the first two described below the disharmony is of lesser degree than in the latter two, although in each the import is equally grave. In depersonalization there is a feeling of unreality; in splitting there is an actual division of the component elements; while in multiple personality, new entities are added to self-consciousness; and in transformation, the explanatory delusional system constructs a new personality upon the ruins of the old.

a. Depersonalization.—This condition is a fragmentation of the personality accompanied by a feeling of unreality. There is a disruption of the feeling of personal identity.

b. Splitting of personality.—In individuals exhibiting basic inferiority, the unity of self-consciousness is forever menaced by dynamic material buried in the unconscious. Whenever such material, a complex, breaks through the repressive forces and again appears in consciousness there exist two distinct and mutually opposed trends of thought combating, modifying, or controlling each other and giving rise to disturbances in consciousness showing as division or splitting. The extreme manifestation of this condition is seen in dementia præcox.

c. Multiple personality.—In this condition, there is more or less regular alternation of different states in each of which there is memory only for the experiences of similar previous states. Thus two or more different personalities are dovetailed, each of which has at its disposal only a part of the total experience of the individual.

d. Transformation of personality.—This striking change comes about through the operation of a fixed and coherently developed delusional system. Delusions of self-importance elaborated through retrospective falsification more and more obscure and transform the consciousness of self until finally a new personality is established.

31. The complex.—As development proceeds, there is ever widening discrepancy between desire and attainment. More and more must there be relinquishment of immediate satisfaction of desire and re-

pression of material into the unconscious. When a highly emotional, painful, or disagreeable experience is repressed, it tends to become a constellation of ideas—a complex functioning independently in the unconscious and continually striving to again appear in consciousness. Therefore a complex is a constellation of ideas in the unconscious which have an independent existence and growth, and a tendency to motivate conduct, a strong emotional tone.

32. Dreams.—The mechanism of dreams is closely related to that of phobias, obsessions, delusions, and other psychoneurotic and psychotic symptoms. Therefore the study of dreams is important in psychiatry. In dreams, things are sometimes recalled which are inaccessible to memory in the waking state. Dreams are studied, explained, interpreted by the psychiatric method. Unconscious mentation goes on ceaselessly during sleep as well as during waking hours. The biological aspect of sleep however appears to require that we retire from the conflicts and perplexities of our daily lives in order to gain strength for the problems of the next day. Thus whatever problems are taken to bed are threshed out in the unconscious during sleep, and we awake refreshed or unrefreshed according to the ability of the unconscious to properly deal with our conflicts. It is conceivable that one whose life is so well ordered that his problems are settled from day to day would not dream at all, or that he would at least have no recollection of them. However, the majority of individuals do dream and preserve some recollection of their dreams, fragmentary as it may be. In the scientific analysis of dreams, it has been fairly well established that all dreams have a meaning; that they are in the nature of wish fulfillments, however disguised or symbolically represented they may be; that the main actor in the dream is always the dreamer and he too may be symbolically represented; that the dream will have some definite relationship to events of the preceding day; and that the dream will, either directly, symbolically, or by association, lead to the dominant type of complex in the individual's life about which is centered his chief difficulty in making a proper adjustment to everyday life. Thus the unconscious conflict goes on ceaselessly, but the individual is at least spared a few hours of conscious participation therein. A fair knowledge of the individual, gained from a personality study, is essential before attempting the interpretation of a dream. Freud says, "When the work of interpretation has been completed the dream may be recognized as the fulfillment of a wish." The psychoanalytic method brings to light the latent content of the dream. Freud believes that the stimulus for the dream is to be found among the

experiences "upon which we have not slept," that is, those of the preceding day; but the material may be selected from any time of life. Freud says the dream is "the disguised fulfillment of a suppressed (repressed) wish. The dream is the symbolic expression of the repressed wish. The biological purpose of dreams seems to be to prevent the interruption of sleep by disturbing sensations or thoughts, from whatever source they come. Therefore the dream is the guardian of sleep, not the disturber of it."

SECTION IX

PSYCHOPATHIC PERSONALITY

General.....	Paragraph 33
Classification.....	34

33. General.—Psychopathic personality as a whole will be considered first, then the different entities concerned as noted in the classification given in Army Regulations will be discussed.

a. Psychopathic personality is the term applied to various inadequacies and deviations in the personality structure of individuals who are neither psychotic nor feeble-minded, the defect existing particularly in the conative, emotional, and characterological aspects of the personality. These aspects do not operate harmoniously. The term "psychopathic personality" is used to define the variant personalities that lie between mental health and mental disease, or the borderline conditions.

b. This condition manifests itself usually in the individual's contact with his environment as illustrated by social antagonism and inadequacy, or in the form of deviations in the psychosexual sphere as illustrated in the form of deviations of the sexual impulse.

c. The beginning of the psychopath in childhood is shown in certain lines of conduct exhibited at that time and illustrated by the sensitive, stubborn child, the one given to outbursts of rage, the petty thief, and the sulky, deceitful, obstinate, defiant child. When he arrives at the adolescent age, he socializes at a lower level. As he reaches maturity, with its concomitant increase of responsibilities and demands, the early tendencies which have been noted become outspoken manifestations, and the egocentric individual develops who is typical of the psychopath, demands much, gives little, and is self-satisfied. His behavior may range from queerness to definite social misfits and includes the extremists, eccentrics, habitual delinquents, and other types. There is no sharply defined dividing line between the normal and the psychopathic personality. Just where the normal ends and the psychopathic

personality begins is a matter of individual opinion and not determined by definite criteria. There are no definitely fixed types, but as a necessity for teaching, descriptive, and classifying purposes, a classification is necessary.

d. Psychopathic behavior can best be explained by psychological conceptions of mental disease. It is the result of intrapsychic conflict which the individual is trying to solve through adjustments that are socially inadequate or destructive. His behavior is the expression of conflicts, unconscious motives, and strivings. In this way, the psychopaths closely resemble the psychoneurotics. Their intrapsychic conflicts are probably the same. The psychoneurotic expresses his conflicts symbolically through his symptoms, as compared to the psychopath who expresses these same conflicts through his irrational, antisocial, and hostile behavior. Therefore, as Noyes states, "it will be seen that it is preferred to look upon the psychopathic personality as the product of dynamic psychological forces rather than as the result of an innate constitutional condition; that is, in the psychopath these psychological mechanisms lead not to a more or less character trait as seen in persons regarded as normal or as a definite symptom as in the neurotic, but to the establishment of dominant patterns of character, temperament, emotion, and conation which lend their imprint to the whole personality and its behavior expressions."

34. Classification.—The classification given in Army Regulations is as follows:

Constitutional inadequacy
 Nomadism
 Emotional instability
 Pathological lying
 Criminalism
 Paranoid personalities
 Schizoid personalities
 Sexual psychopathies

a. *Constitutional inadequacy*.—Under this are classed those individuals who either from lack of initiative, ambition, perseverance, or judgment, through shiftlessness or tactlessness, or a planless, improvident existence, and often in spite of good educational, social, and economic opportunities, make a notorious failure of everything they attempt.

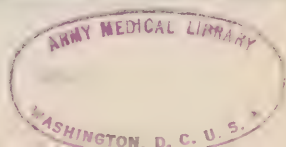
b. *Nomadism*.—The impulse to wander is inherent in some degree in all persons. It is so pronounced in certain races as to govern their mode of existence and social organization. Exaggeration of the no-

madic urge in certain individuals is often turned to useful account by their selection of an occupation involving more or less constant travel and change of scene. In the pathologic nomad, the urge outweighs the ability for such sublimation and the tramp or hobo results. He frequently shows a lack of inhibitions in other social directions. He may beg, steal, trespass upon private property, or commit other unsocial acts; but he does these things primarily from necessity rather than with criminal intent.

a. Emotional instability.—The tendency of all individuals under everyday stress is to show at certain or irregular periods some variation in mood. When these fluctuations are within the so-called normal limits, or where they arise in consequence of some unusual physical or mental stress but do not contravene conventional limitations, they need cause no grave concern. But when an individual shows extreme mobility and exaggeration of emotional response, a tendency to be at one moment in the depths and the next in the heights as the result of ordinary or unusual stimuli, and particularly where such emotional excursions are accompanied by rapid changes from affection to hatred or from complete egoism to exaggerated generosity, he can be classed as emotionally unstable. Crimes of violence or other unconsidered acts may be carried out by such individuals.

d. Pathological lying.—(1) The tendency to falsification entirely disproportionate to any discernible end in view is the characteristic trait of the pathological liar. There appears in these individuals a morbid activity of the imagination, an inaccuracy of memory, and a certain instability of the emotions and volitions. They apprehend easily, comprehend new situations, readily acquire all sorts of information, and converse fluently on the most varied topics. Able to convey the impression of being cultured and well-informed, their knowledge is nevertheless superficial and made up of incoherent scraps; that is, a mixture of details insufficiently comprehended and elaborated and at times even falsified. Their thoughts lack system, order, and coherence; their judgment is immature; and their conceptions of life shallow and insincere.

(2) There is extraordinary mobility of the content of memory. Recollections, moods, wishes, and accidental impulses alter and color the experiences of life in various ways so that before long there appears an extricable mixture of truth and fiction. A characteristic feature of morbid lying is the apparent satisfaction the patient derives from willful falsification of memory, the "joy of lying." The mazes of misstatements inevitably lead to situations from which there is no escape except by the utterance of new falsehoods. The swindler



in many important respects is closely identified with the pathological liar.

e. Criminalism.—This condition finds early expression in perversities of conduct and character shown as selfishness, lack of honor, cruelty, deceit, and absence of natural affection. Education usually fails to modify such natures. They are morally defective and offer little resistance to temptation and sudden impulses. There is great emotional irritability, vindictiveness, unreliability, and instability. Punishment effects no lasting change and the resumption of former habits and practices is the rule.

f. Paranoid personalities.—Stubborn adherence to fixed ideas, marked conceit, and suspiciousness are the basic traits of these individuals, and lie at the root of all their maladjustments. They show a contempt for the opinions of others, a distortion of practical values, and a tendency to be argumentative.

g. Schizoid personalities.—Under this are classed the introverts, in whom there is an intense self-awareness, a realization of inadequacy, and a feeling of uncertainty toward the outside world which produces a peculiar sense of inferiority. Such individuals are either unwilling or unable to take cognizance of reality and follow paths laid out for them by instincts or emotions. Their contact with reality is fragmentary and hazy. Reality to them is unbearable and is, therefore, largely eliminated. There is an inability to distinguish clearly between reality and fantasy. Thinking is likely to be illogical and at times absurd.

h. Sexual psychopathies.—Rosanoff discusses anomalies of sexual life under anomalies of degree, eroticism and frigidity; anomalies of nature, sexual perversion and sexual inversion.

(1) *Anomalies of degree.*—Eroticism results in venereal excesses and often in indecent acts and attempts of rape. Frigidity consists of an indifference and even an aversion of the subject to sexual connection; at least to normal sexual connection, for frigidity may be associated with sexual perversion or inversion. A curious and apparently paradoxical fact is its frequency among prostitutes.

(2) *Anomalies of nature.*—(a) *Sexual perversion.*—Sexual perversion consists of the abnormal character of the conditions necessary to excite sexual desire and sometimes its gratification. Its most common forms are masturbation, fetishism, exhibitionism, sadism, masochism, bestiality, and necrophilia.

1. *Masturbation.*—Not only psychiatrists but other physicians as well are frequently called upon to discuss with a patient the subject of masturbation. According to the best information available at this time, masturbation of itself

is harmless. The habit may arise either from circumstances being adverse to normal gratification of the sexual impulse, from repugnance against the normal sexual act, or to a persistence into adult life of a childish autoerotism. The practice of the habit usually carries with it a feeling of shame and a belief that it is among the causes of insanity. Excessive indulgence or the practice carried forward into adult life, is rather an expression of nervous instability and feeble inhibitions than a cause of mental disorder. In the chronic offender, there are usually other very definite indications of a constitutional psychopathic state.

2. *Fetishism*.—This sex anomaly is largely confined to the male sex. Fetishism is one in which sexual excitement, or more rarely gratification, is caused by the sight or contact of certain objects or certain parts of the female body other than the genital organs. Fetishes may be various objects such as shoes, stockings, handkerchiefs, toilet articles, garters, in fact anything used in intimate contact with the female body. The choice of the fetish is believed to depend upon the impression which was accidentally associated with the first genital excitement of the individual with a psychopathic disposition.
3. *Exhibitionism*.—Sexual perversion may show as an uncontrollable desire to exhibit parts of the body, often the genitals only, which are ordinarily clothed. It is usually accompanied by sexual excitement and frequently with masturbation.
4. *Sadism*.—This consists in a sense of voluptuousness derived from suffering which the individual witnesses or inflicts upon his victim. It is generally associated with a state of sexual excitement and is exercised chiefly upon women and children.
5. *Masochism*.—This anomaly is more frequently encountered in women and consists in an abnormal pleasure which the subject derives from his or her own suffering or humiliation. The pleasure is sexual in character.
6. *Bestiality*.—This consists in an impulse to copulate with animals. Like all genital impulses, it often assumes the shape of an imperative idea which the subject only resists by a great effort of the will.
7. *Neorophilia*.—This consists of a particular pleasure which the subject experiences from the sight or contact with a

cadaver. It is sometimes accompanied by an impulse to defile the corpse.

(b) *Sexual inversion*.—This anomaly is believed to be congenital and consists in a contrast between the physical sex and the psychic sex; the subject presents the sexual tendencies of the opposite sex, often showing even many of the physical characteristics. In this condition, there appears to be an actual sexual love for persons of the same sex and a feeling of indifference or disgust toward contact with the opposite sex. This is particularly true of the frank homosexual who is both conscious and proud of his sexual inclinations. He is inclined to look upon himself as a superior person, is narcissistic to a noticeable degree, and usually of a paranoid personality. Between the normal heterosexual person and the invert there exist all grades and shadings. There is doubtless a vast army of individuals with submerged tendencies to sexual inversion, the only indication of which is seen in their choice of occupation and associates.

SECTION X
MINOR PSYCHOSES

	Paragraph
General	35
Neurasthenia	36
Hysteria	37
Psychasthenias	38

35. General.—Under the minor psychoses are grouped the psychoneuroses and neuroses. The term “neurosis” will be used synonymously with “psychoneurosis.”

a. The psychoneuroses comprise a group of disorders in which mental forces or ideas, of which the subject is either conscious or unconscious, serve to bring about various mental and physical symptoms. A psychoneurosis is an automatic defense of the nervous system through which, for the time being, the individual is protected from a succession of experiences which tend to weaken him and in the long run, to threaten his continued existence. This defense springs from the activation of certain instincts into experiences of an abnormal kind which take on the appearance of symptoms or symptom groups, presenting themselves as disease pictures. According to the mechanism involved, such symptoms become organized into stereotyped forms of disease which are capable of description and differentiation. The psychoneuroses exhibit those early departures from the normal which, in more aggravated form and definite grouping, constitute the psychoses.

b. The neuroses functionate and fill a real need of the human organism for that kind of expression alone. The neurosis may, therefore, be

regarded as a biological necessity expressing reactions that do not differ in any important way from those seen under conditions of stress and conflict where existence is possible only through overcoming obstacles. They are adaptive reactions of the nervous system, springing from a real or fancied need of the organism. They are protective or defense structures which spring into activity when the organism is in danger or when the organism finds it more advantageous to substitute for its normal environmental reactions something else, which, in this instance, takes on this guise of a disease. This is called a "neurosis." The various conflicts arising out of the impact of the human nervous system against difficult economic, social, domestic, and traumatic stresses give the occasion and the necessity for this defensive reaction. If these facts are kept in mind, the understanding of the neuroses both clinically and symptomatically will be facilitated. There follows from such a conception a great deal of illumination concerning the intricate series of questions arising out of a disease picture often psychogenetically initiated and somatically presented.

(1) Whether or not a neurosis is organically founded is of minor importance when it is once clearly recognized that a neurosis is perfectly capable of developing on and from an organic condition. In such an instance, it can show the identical reactions, structures, and mechanism as is the case where no such thing is present. It is by no means certain that a neurosis stands out as a pure picture of psychogenic origin when it is possible for all sorts of supplementary mechanisms to be put into activity through the emotional accompaniment of the neurosis structure. For example, the internal secretory glands may fulfill the role of causation, of coincident activity, and likewise of effect. There must be in any convincing scheme in the explanation of the neurosis, a place for all the adventitious reactions of the total mechanism, whether of so-called organic origin or not.

(2) In a neurosis, there are certain fundamental facts that must be made clear. If this be done, the transition to clinical expression and types is readily understood. It is essential to appreciate the fact, first of all, that neuroses are fundamental reactions of the organism to traumata of various kinds. These traumata are necessary incidents to organized life. They are nothing more or less than the contact experiences of the individual with his environment, and they arise out of the struggle to maintain a place for himself and those dependent upon him against the eliminating tendency in all social structures. Society protects the individual in this struggle but to pay for that protection, the individual must give and surrender himself to the necessities of his social environment. This conflict is best expressed through the awakening of the primitive and essential instinct found

in all living beings, the instinct of self-preservation. This instinct is the individualistic impulse, so bound up with life that it cannot be divorced from it. It is the essence of the individual continuity as the instinct toward species preservation is the essence of communistic continuity. Of these two instincts, that of self-preservation is by far the more primitive and persuasive. It finds its expression as soon as life is manifest and is constant throughout life. The instinct of race continuity develops later and becomes at certain periods dominant, associated as it then is with many social factors touching the complex organization of society.

(3) The defense that is suggested in the definition is not to be regarded as a volitional act, or one that carries with it a state of awareness on the part of the individual. It springs from a very real need of the organism. In many instances, this need has its origin in a mental reaction that suggests to the patient that there is something at variance in the normal functioning of his total organism. The element of wish or will cannot be totally excluded from this formula, as there is a great deal of evidence at hand to suggest that in many cases the first conscious manifestation of a beginning neurosis is the desire that something might intervene as a protection from the conflicts arising out of a particular stress of circumstances. As long as the necessities of the occasion are taken into account, there is every reason to admit that desire, wish, or will has a place in the preliminary state out of which a neurosis is finally developed. This wish or will to develop a neurosis is perfectly understandable if it is kept in mind that behind the wish is a deep-lying need, influencing the patient in that direction. In the development of a neurosis, behind the wish, expressed or unexpressed, on the part of the patient to be ill, there are the activities of a deeper lying instinctive appeal which has for its object the safeguarding of the total organism. There is no isolated nor abstract desire as far as the patient is concerned to become the subject of a neurosis, but a requirement of the organism that drives him to want or wish or will to be that way. There may be in the neurosis a sense of satisfaction or contentment in the existence of the diseased condition, but this is so because the organism of the patient is insistent that something shall stand between him and the conditions which he is forced to face, and which are too much for him at the time. The surrender is through a compromise, and this compromise is a neurosis. This is his protection, and behind it is a feeling of safety no matter how disagreeable the process may be through which he is going. That there should be some sense of satisfaction in such a mechanism is self-evident.

(4) The neurosis therefore is a compromise, the best that the patient can devise at the time, and in the protection of this compromise he can manage to keep his place in his environment and, what is of greater importance, he is saved from the disrupting sensation of utter defeat; the feeling of total inadequacy. In considering a neurosis from this standpoint, it is obvious that the defensive mechanism of the whole organism becomes active so that every device commonly energized by such a need comes into the play of forces that tend to reach that end. The vasomotor and glandular systems, etc., become so bound up in the final display that often it is with the greatest difficulty that the individual features can be separated.

(5) In a theory that attempts to be as broad as this, almost any notion that has proved of value in explanation of the neuroses and almost any kind of etiological factor may be included. The various causation theories of Freud, the mechanism of Janet, the congenital nervous instability of the Charcot school, with its insistence on the role of suggestibility, the fatigue theory so much in evidence in the writings of S. Weir Mitchell and his students, and a host of others can all find a place. It is necessary to find out where they play their role, how much importance should be given to each of them, and to make use of them so long as they fit in with the notion that a neurosis is the crystallized clinical manifestation of the protective instinct of the nervous system.

(6) Freud found the essential cause of every psychoneurosis in some disturbance of the sexual function, but dispassionate study of the psychoneuroses such as those of warfare shows that there is no reason to suppose that the sexual life played any essential part in the causation. These disorders have come to be understood as the result of the activation of another instinct even more fundamental and elementary than the sexual, the instinct of self-preservation, particularly that phase of it relating to protection from danger. Obviously, warfare awakens an instinct which is rarely activated in the life of a member of a modern civilized community. In warfare, tendencies are awakened which would otherwise lie dormant and the instinct of self-preservation is the one most likely to be activated, while in time of peace, the sex instinct is probably the most active, although instincts less elementary and of later development may be the dominant factor. No single etiological factor can be looked upon as the essential cause of every neurosis.

(7) There is much reason to believe that the activity of the glands of internal secretion are concerned in activating such emotions as fear

and in contributing to the habituation of symptoms already established. Certain of the internal glands are connected so closely with the defensive qualities of the organism and their function seems in the main so definitely to subserve instinctive reaction in the face of anticipated danger or real contact with destructive agencies, that they must be considered as definite factors in the chain of positive causation out of which the neuroses arise. They are so closely bound up with the primitive emotion of fear, for example, that there is no escape from the conclusion that they are a vital part of the mechanism which tends to guard the organism as a whole. For this same reason, they cannot be separated from the defensive mechanism as it is phylogenetically manifested in the organization and perpetuation of the neuroses.

(8) It is necessary to appreciate the fact that both in the formation of a neurosis and in its continuation, there is a commingling of many, if not all, of the defensive activities of the organism, so that nothing short of actual organic changes need be explained away.

36. Neurasthenia.—The term "neurasthenia" was first introduced by Beard in 1868, and up to the present time there is no equanimity of opinion nor agreement as to the mechanism and factors involved in neurasthenia. Beard's idea was that due to the increased tension of his age, nervous anabolism could not keep up with nervous katabolism with the resultant being a weakened nerve force. All poorly understood neurotic symptoms have been classed as neurasthenia at one time or another. Freud believed the etiology of neurasthenia to be somatic, however the majority of psychiatrists now believe it to be a psychological disturbance. No one now believes that masturbation is the cause of neurasthenia, or that an impaired and exhausted state is an etiological factor. The real source, the real etiology is to be found in psychic conflict and therefore is a psychological conception.

a. Symptoms.—The symptoms may be classified as general and local; under local the alimentary system, circulatory system, vasomotor, genito-urinary system, respiratory system, nervous system, and mental. Under general, is listed first fatigue, which is chiefly manifested when the patient's interest is at a low ebb; then loss of weight, which is usually dependent on appetite failure.

(1) The disturbances related to the alimentary system are capricious appetite, anorexia, indigestion, distention, eructation, nausea, vomiting, constipation or diarrhea, and mucous colitis.

(2) Circulatory disturbances show varying degrees of cardiac discomfort, tachycardia, palpitation, pseudo-anginal sensations, and heart irregularities.

(3) Included under vasomotor symptoms are pallor, blushing, sweating, coldness, heat, and numerous other phenomena.

(4) Under the genito-urinary system are found impotence, nocturnal emissions, dysmenorrhea, dyspareunia, frequency of micturition, increased urinary output, "loose kidney", and many other manifestations.

(5) Related to the respiratory system, neurasthenics are troubled with frequent colds, shortness of breath, increased respiratory rate, shallow breathing, etc.

(6) The more important symptoms included under those of the nervous system are peculiar sensations in the head or any other part of the body. Feelings of swelling of the scalp, tight band around the head, bursting and stuffiness of the head, headache especially in the occipital region, peculiar uncomfortable or painful sensations in the abdomen, rectum, breasts, etc. An almost universal complaint is pain in the back. Giddiness, dizziness, and insomnia are common. There may be photophobia, muscae volitantes, eye-muscle fatigue, ear noises, and intolerance of ordinary sounds.

(7) The prominent mental symptoms are inability to concentrate, uncertain memory, fear of insanity, self-consciousness in the presence of others, feeling of inferiority, irritability, depressions, phobias, and anxieties. There is a state of irritable weakness. There is a subjective state of weakness and exhaustion. This instability and irritability affects the vegetative nervous system with resulting disturbances as mentioned in the vasomotor and cardiac functions. The basic cause is that of psychic conflicts transferred or displaced to an uneasiness of mind concerning physical organs and their processes.

b. Differential diagnosis.—(1) Distinction must be made between neurasthenia and the depressed phase of manic-depressive psychosis. The prominent differential factors are that in manic-depressive psychosis there are definite episodes, while the neurasthenic has prolonged illness. The neurasthenic is concerned regarding his physical complaints while the manic-depressive is not. The manic-depressive is not concerned with his environment, and shows no response, while the neurasthenic is usually all response.

(2) Differential diagnosis must also be made at times between early schizophrenia and neurasthenia. However, the schizophrenic sooner or later develops a delusional system and he does not have the variety of physical symptoms noted in the neurasthenic.

(3) A diagnosis of neurasthenia or of any of the neuroses is not warranted merely because the physician cannot find a physical cause for the patient's symptoms. A diagnosis of neurosis in any form is not justified until an emotional conflict or stress sufficient to explain the symptom has been discovered. Neurasthenia is then a disorder of

protean physical and mental manifestations associated with a state of unusual suggestibility. Furthermore, it is a disorder the manifestations of which are primarily and fundamentally instinctive in nature and calculated to prevent the organism from continuing a line of activity the end of which is material destruction of the organism. The growth and development in a clinical way is often slow and impossible to determine until the final stage is reached when the presence of the subjective sensation dominates. Depression, helplessness, morbid attitude, and subjective interest in his own feelings form a symptomatic display easily appreciated and easily recognized. This psychical state so dominates that the underlying mechanism may be lost sight of entirely and attributed to psychical causes. The particular symptoms in a given case likely will show simply as a piling up of normal personality trends as in other neuroses. Two general types of neurasthenia victims are those individuals with inherited incapacity or early acquired defects in their organism which limit their activities this side of fatigue to the minimal, and those who become so from the stresses of continuous conflict with environment, or who, as a result of some acute experience associated with a marked overload, respond with acute fatigue developing into chronicity which gives to the neurasthenic its particular quality of habituation. The symptoms indicate an organic defense and a physiological conservation. The organism as a whole must defend itself against further ravages or submit to destruction. The symptoms therefore in a given individual are likely to be those best calculated to erect the best possible defense.

37. *Hysteria.—a. General.*—In Pierre Janet's theory of a faulty synthesis of the personality resulting in dissociation, cleavage, or splitting, and Sigmund Freud's theory of conversion of the conflict (between desire as represented by the buried complexes and attainment as combated by attitudes of mind the result of education) into a physical symptom or symptoms, are found two of the most important contributions to the study of the hysterias. Janet believed that through faulty synthesis of the personality, certain groups of ideas drop away from association with the main portion of the personality into the unconscious, there to exist independently and produce results irrespective of correction from the remainder of the personality. Therefore he saw the activities of the dissociated or split-off personality made manifest in the hysterical symptoms. Freud developed the theory of Janet; he perceived that ideas out of harmony (in conflict) with the consciousness of the individual do not merely "drop away" from consciousness, but instead, are forced or

repressed (with or without awareness) into the unconscious, there to function independently and thus bring about dissociation. These unacceptable groups of ideas (idea constellations or complexes) though buried in the unconscious, continue to act, go on functioning independently of awareness, continually striving due to their dynamic quality to break through the repressive forces and again appear in consciousness. Conflict, repression, and complex formation are normal processes. But it is the eruption (breaking through) of these over-dynamic, split-off complexes, and the way in which they manifest themselves that produces the different types of mental disorders; the energy of the eruption flows in different directions, the direction taken being determined by the personality trends. The peculiarity of the hysterical mechanism is that the unacceptable affect of the complex is drafted into bodily innervation, thus by conversion producing the physical symptoms of the disorder; that is, conversion is the essential feature of the symptomatology of the hysterias and all the disturbances, sensory as well as motor, are purely mental in origin.

b. Definition.—Hysteria is a type of reaction adopted unconsciously, but for a very definite purpose, in order that a problem may be solved through a disguise of the symptom. All authorities agree that hysteria is a defense or protective mechanism. Moebius defines hysteria as "a state in which ideas control the body and produce morbid changes in its function." Janet says, "hysteria is a form of mental depression characterized by a retraction of the field of personal consciousness and a tendency to the dissociation and emanicipation of the systems of ideas and functions that constitute personality." The fundamental trouble is a loose organization; a faulty synthesis of the personality. Hysteria may be said to be a type of reaction belonging to individuals who in mental organization are still children. He emphasizes the importance of amnesia through which certain experiences drop out of the field of consciousness, with resultant changes of personality which eventually may become doubled or variously fragmented. Babinski says, "hysteria is a special psychical state capable of giving rise to certain disturbances which can be produced by suggestion or removed by persuasion." Freud explains hysterical manifestations as the result of repression of disagreeable experiences followed by dissociation, breaking through of the complexes, and the conversion of the material into somatic symptoms.

c. Frequency.—The hysterias are among the most common of mental disturbances.

d. Time of life.—The majority of cases occur at the age of puberty and adolescence. After 25 the frequency declines, and occurrence after 45 is rare. It is uncommon before ten, but may develop as early as the second or third year. Males and females are affected in nearly equal ratio.

e. Etiology.—The etiology can only be understood in the light of explanation of the mechanism. Such influences as trauma, shock, profound emotional disturbances incident to situations of unusual trial, difficulties and perplexities, toxic substances, and acute and chronic illnesses operating upon a background of constitutional psychopathic inferiority, cause an inability to make the healthy compromises (adjustments) by which the individual must continually establish and reestablish his relation to society.

f. Pathology.—There are no demonstrable pathological lesions.

g. Symptomatology.—(1) *Mental.*—The outstanding characteristic of the hysterical constitution is instability shown by frequent and abrupt changes of the emotional attitude, conduct continually motivated by fluctuations of feeling, exaggerated self-consciousness, selfishness, dissatisfaction, insatiable cravings, hypochondriacal complaints, vehement expression, lack of uniformity and persistency, and susceptibility to all sorts of influences. Many of the patients develop a most remarkable attitude toward their condition. They believe it confers distinction, become proud of it, and parade their invalidism, thoroughly enjoy the "luxury of woe," tyrannize their entire family, and make of their invalidism an asset through which to fulfill desire without reacting along the line of normal effort.

(2) *Physical.*—These are wholly functional, mental in origin, and exceedingly protean because the psychic pressure has all the somatic pathways at its disposal. They consist chiefly of different degrees of paralyses of a single limb; astasia abasia; choreiform movements; contractures; localized and general convulsions; aphonia, impairment of speech; numerous sensory disturbances, including paraesthesia, anaesthesia, hyperaesthesia, and visual disturbance; globus hystericus; singultus; fainting fits; anorexia; obstinate vomiting; disturbance of respiration; and anomalies of secretion. Anaesthesia of the mucous membrane of the mouth and cornea are regarded as characteristic symptoms of hysteria. Disorders of sleep are frequent. All these symptoms are dependent in their appearance, persistence, and departure upon psychical influence. Often, hemicrania and convulsions can be made to disappear by pressure on the eyeballs; contractures or paralyses to vanish by firm pressure over the ovaries or in the hypogastric region, or by an unexpected dash of cold water. Patients bedridden for years, reduced by fasting, secretly inflicting

wounds to incite sympathy, may be immediately transformed into different individuals by a sharp command, new environment, or some sudden freakish event. Furthermore, the symptoms sometimes disappear when the patients believe themselves unobserved or are left alone, only to reappear when their illness is referred to or the physician appears. The various physical and mental symptoms described are characteristic of the hysterical personality and constitute a groundwork upon which develop other characteristic conditions, prominent among which are:

h. Transitory states.—The transitory hysterical states comprise—

(1) *Befogged states.*—These are characterized by a marked clouding of consciousness of varying duration and either follow, take the place of, terminate in, or are interrupted by a convulsion. Or there may be a simple attack, with slight clouding of consciousness, sinking to the floor without injury, or showing in one way or another external influence.

(2) *Convulsive attacks.*—While complicated, these attacks may be purposeful. The patient twists about, groaning and screaming, rolls over and straightens out, strikes the feet on the floor, or rolls up like a ball; while at the same time, there is a spasm of the diaphragm, slowing of the pulse, and rolling of the eyes. Following such an attack, the patient may lie quietly and remain irresponsive except to powerful stimuli. Such a condition, interrupted by occasional convulsion and short lucid intervals during which food is taken, may last from a few hours to three weeks. This is termed "hysterical lethargy."

i. Course and prognosis.—The course of this psychoneurosis is usually protracted; it may extend over many years. Recovery is usually possible through proper treatment.

j. Differential diagnosis.—Hysteria must be differentiated from epilepsy, malingering, and schizophrenia.

(1) *Hysteria.*—Consciousness never completely abolished. No sudden involuntary fall, serious injuries, nor biting of tongue. Manifestations diversified and extravagant. Seizures specially induced by external influences and may be suddenly aborted by strenuous treatment.

(2) *Epilepsy.*—Consciousness completely abolished. Sudden involuntary falls, serious injuries, and biting of tongue. Manifestations uniform. Independent periodicity. Mental weakness more frequent and pronounced.

(3) *Malingering.*—The unconscious reaction differentiates hysteria from malingering. The malingerer consciously counterfeits some physical sign or symptom or some mental disturbance for the purpose

of attaining a particular goal. The motives are the same in both hysteria and malingering. These important facts should be remembered when examining pilots who for some reason or other, conscious or unconscious, develop physical or mental symptoms which excuse them from flying.

(4) *Schizophrenia*.—Differential diagnosis is at times difficult to make with regard to schizophrenia. However, the hysteric shifts his emotions more easily, has no disturbances of associations, responds more quickly to an emotional reaction, has no desire to be left alone, and there is no deterioration as noted in the schizophrenic.

k. *Explanation of the Freudian conversion theory*.—In the hysterical type, disagreeable complexes succeed (consciously or unconsciously) in coming to expression symbolically; that is, by what Freud calls "conversion," and achieve expression as physical symptoms. According to Freud, the complex is due to a psychic conflict of a sexual character. The conflict being between desire, as represented by buried sexual complexes, and attainment, as opposed by attitudes of mind the result of education. The dynamic energy of the unacceptable constellation of ideas (complexes) breaks through the repressive forces but the subject is spared the pain of disagreeable affects by "conversion" of the energy into physical symptoms; there is an abnormal compromise reaction. This is made clear in the following apt illustration by Dr. William A. White, "a patient ought to make a call upon a recently bereaved friend. This is recognized as a distinct obligation, but the patient's infantile necessity of escaping reality and seeking pleasure makes the duty seem a very onerous affair. Thus arises a conflict between duty, born of conscious appreciation of the social obligation, and desire, born of the childish inability to make the necessary sacrifice of personal effort. As a result, the patient develops a headache, and so, being ill, does not have to go. The selfish desire is thus gained, and at the same time the social demands are satisfied by the illness which offers an acceptable excuse, while the painful recognition of the patient's own selfishness is converted into the pain in the head. The affect is thus displaced, the whole situation symbolically distorted, and the two opposing tendencies, conscious and unconscious, both satisfied. Incidentally, the pain in the head is a self-punishment for not obeying the socially useful and unselfish demand and has as a function the tendency to drive the individual along the path of development, for only by following this path can the pain be avoided. An adequate adjustment by a synthesis at a higher level would result in making the call, wanting to make it, and deriving pleasure and satisfaction from having comforted the bereaved person.

"This is such an example as everyone has constantly presented to him by all manner of persons placed in disagreeable circumstances. The tendency to develop some minor physical ill as an excuse and an escape from a recognized duty is used very widely—one is tempted to say, at times by almost everyone. It is the fundamental hysterical (conversion) mechanism which throws upon the body, makes it the scapegoat of the responsibility for our moral failure. And yet, more than this, it produces suffering and pain, which here as elsewhere point the way of relief by making the wrong path as unattractive as possible."

38. Psychasthenias.—*a. General.*—(1) The psychasthenias comprise a group of disorders characterized by doubt and hesitation, obsessions, fears, and impulsive acts. Therefore under the psychasthenias, it is customary to group the conditions variously termed fixed ideas, obsessions, imperative conceptions, impulses, morbid scruples, phobias, doubts, agitations, mental and motor tics, feelings of strangeness, and feelings of changed personality.

(2) Always there is clear recognition of the unreasonable nature of the act, idea, or condition and a consciousness of defective self-control; none of the manifestations, however, either singly or in groups, ever influence the intellectual, emotional, or volitional fields or color the personality to a degree rising to the frankly psychotic level.

(3) There is a fundamental incapacity to make a choice. It is the fear of the consequences of choice, either through experience or through anticipation of what the choice may bring about, that produces the static condition which is the chief characteristic of the psychasthenic's attitude toward his environment. The fixed ideas, phobias, queer conduct anomalies, and stereotyped expressions are the result of the primary defect in mental make-up.

(4) Using obsessions and phobias as broad terms including all the above conditions, it is readily seen that they may pertain to nearly every phase of human feeling and activity. With Janet may be classified the obsessions as those of sacrilege; of crime; of shame of self or persons; and those of hypochondriacal nature. For the phobias, the Greek language has been searched to find sufficient names; claustrophobia, fear of closed places; agoraphobia, fear of open places; amazophobia, fear of vehicles; misophobia, fear of dirt; and a hundred others testify to the range of human feeling and wealth of the Hellenic tongue. In many cases, fears are devoid of such definiteness, being vague and indefinable. Janet has laboriously tabulated the phobias as fear regarding the body; fear of objects; fear of situa-

tions, physical and social; and fear of certain ideas. Under these heads, he has meticulously listed over 40 different varieties with innumerable variations.

(5) The manifestations of one or more of the above mental symptoms may persist for many years in the same patient, never rising however to dignity nor importance, merely ruffling now and then the comparative calm of the life current tolerantly and indulgently construed by the associates as negligible oddities or eccentricities.

(6) On the contrary, in large numbers of cases, these obsessional manifestations definitely color the personality, even motivating conduct. Originating in some emotional shock or striking experience, their repetition becomes easily determined by some object, circumstance, sound, smell, or other suggestive factor, and conduct shapes itself toward avoiding the recurrence and exhibition of tendencies clearly understood by the individual to be incongruous and inconvenient. Thus a locality where once was experienced claustrophobia is shunned; in dread of contagion, there is refusal to shake hands; and fear of poison compels personal supervision of the cooking or partaking only of food first tasted by another. These and similar precautions, by continuously narrowing the opportunities and limiting the radius of action, may eventually result in self-restriction to the house or even to a single room.

(7) Individuals morbidly impelled to touch certain objects, turn in an exact fashion, step in a certain manner, retrace a certain number of steps, repeat words or lines when reading, do these things habitually and are made extremely uncomfortable, almost frenzied in extreme cases, if prevented. Curiously enough, these individuals freely admit their behavior is nonsensical but avow they cannot help it. There is about it all a laughable incongruity quite apparent to the individual and told about in a jocular, shamefaced manner. It is, therefore, an emotional and not an intellectual conviction. These obsessive doubts represent a defense against self-knowledge. The behavior appears meaningless, but when stopped or renounced, a feeling of discomfort and anxiety follows. Therefore this behavior should be recognized as neurotic ceremonials.

b. Time of life.—No age is exempt, but most cases occur between the ages of 20 and 50, with the maximum at about 30. Females preponderate over males in the ratio of three to one.

c. Etiology.—The psychopathology involved may be summarized as follows: These phobias, compulsions, and obsessions originate from repressions and are protective and defensive in purpose. A complex is repressed, usually instinctive in character, but due to some evok-

ing element, is allowed to exert itself in consciousness but is unrecognized by the consciousness. Consequently the result appears to be a fear with no explainable basis.

d. Course.—The onset is more likely to be insidious than to appear suddenly in the wake of an emotional shock. A period of self-questioning, of introspection, is commonly crystallized into the particular obsession that thereafter has a partial or almost complete domination of the individual and may last for the remainder of life. Many psychasthenics regain their self-mastery almost completely only to relapse on some further provocative occasion. Those individuals are fundamentally unstable, and Janet insists that psychasthenia, being a psychological condition, is not foreign to mental disease and cites numerous cases ending in definite mental alienation. It may readily be admitted, that given stresses sufficiently severe, numerous and prolonged, the psychopathic inferior may be pushed out of the psychoneurotic borderland into the region definitely psychotic.

e. Diagnosis.—In a typical case, diagnosis is sufficiently simple. Neurasthenia, hysteria, and the psychoses must be carefully excluded inasmuch as they also exhibit phobias and obsessions. The psychasthenic nature of the obsession will be strongly indicated if the somatic and stigmatic indications of neurasthenia and hysteria are absent and the psychoses also excluded, if aside from the obsessions there is good physical and mental health and the patient recognizes the groundlessness of his morbid idea.

f. Anxiety neuroses.—Freud separated from the psychoneuroses a clinical type he called "anxiety neurosis" in which the symptoms all group themselves about the cardinal one of morbid anxiety or anxious expectation. The prevailing condition is one of general irritability (or excitability) regularly associated with anxious expectation, apprehension, or dread. This general state is disturbed by fluctuations in intensity and interrupted by exacerbations constituting the anxiety attack. These crises or attacks present numerous physical symptoms which may be regarded as the bodily accompaniments of fear—such as cardiac and respiratory disturbances, profuse sweating (often nocturnal), nausea, vomiting, diarrhoea, dizziness, trembling, shaking, parasthesia, and locomotor disturbances. The locomotor disturbances are noteworthy in that there are sensations, such as heaving ground, heavy, shaking, sinking legs, and feeling of impossibility to maintain the upright position, notwithstanding which the patient does not fall.

The quality of anxious expectation is emphasized as the outstanding feature of the symptomatology aside from the "attacks." There

is a state of continuous uneasiness, concern, trepidation, and fear. It may be said there is a quantum of "freely floating" anxiety which controls ideation by expectation and is forever ready to unite itself with any suitable idea. Freud, in distinguishing the anxiety neuroses from the obsessive compulsive states, says that the latter depend on repressed sexual episodes in early childhood, but that the anxiety neuroses depended on the conflict between sexual excitation and sexual satisfaction. The unsatisfied excitation expressing itself in the various physical and mental symptoms noted in the anxiety states.

SECTION XI

EPILEPSY

	Paragraph
History.....	39
Distribution.....	40
Prevalence.....	41
Frequency of attacks.....	42
Season and time.....	43
Sex and age.....	44
Definition.....	45
Etiology.....	46
Pathological anatomy.....	47
Symptomatology.....	48
Epileptic character.....	49
Clinical varieties.....	50
Sequelae.....	51
Prognosis.....	52
Diagnosis.....	53
Differential diagnosis.....	54

39. History.—Epilepsy is frequently mentioned in the earliest medical literature. The term is derived from the Greek word meaning "to take or seize upon", and was originally spelled "epilency." The ancients knew it as the disease of Hercules. The Romans called it "morbus caducus" or "falling sickness"; and the Egyptians "morbus lunatus et astralis" because they thought it due to the influence of the moon and stars.

40. Distribution.—Epilepsy occurs in all countries, in all races, and at all cultural levels. It probably occurs in all vertebrate animals; certainly in the horse, ox, pig, dog, cat, rabbit, in poultry and birds.

41. Prevalence.—Epilepsy is very common. There is no other disease so widely spread in time and space. It is estimated that there are from 300,000 to 500,000 epileptics in the United States, of whom less than 5 percent are in institutions. From statistical studies, it has been stated that epilepsy is becoming less frequent in the United States.

The incidence is stated as follows for other countries: Switzerland, 1 to 750; Russia, 1 to 1,500; Scotland, 1 to 750; and France, 1 to 1,000. There must be a host of petit mals, as well as those who have the even less obtrusive minor equivalents and go unrecognized.

42. **Frequency of attacks.**—Some patients have attacks very frequently while others may have but two or three during a lifetime. Some have attacks at irregular intervals, in others they occur with considerable regularity; in fact, the regularity of occurrence may be very striking. One author reports a patient all of whose attacks occurred at 6 a. m.; another had all between 2 and 4 p. m.; and another between 7 and 10 a. m. The regularity may assume a definite periodicity. A case is reported as having had five attacks, one each June for 5 successive years. A patient may have a series of attacks known as serial epilepsy; or a series of hundreds may occur without restoration to consciousness, status epilepticus; these cases are likely to terminate fatally. The attacks are apt to be more frequent in petit mal than in grand mal. A case of petit mal is reported with 26,124 attacks in 5 years without mental impairment; and a case of grand mal with 519 attacks in 49 hours.

43. **Season and time.**—There is no seasonal incidence. The attacks may occur at any time of the day or night. Nocturnal epilepsy is by no means infrequent and its occasional occurrence may go undetected for years especially if the patient sleeps in a room by himself, or if the significance of bed wetting, blood on the pillow, bitten tongue, and feeling sore and fatigued in the morning are not understood.

44. **Sex and age.**—The syndrome epilepsy is more frequent in males than in females, the incidence being about 60 to 40 percent respectively, according to Noyes. The first attack may occur at any age, but in 75 percent of the cases it is before the twentieth year. The greatest incidence is before the fifth year with an increase in frequency at about the seventh year and again at puberty. The incidence of epilepsy after the thirtieth year should arouse suspicion of organic disease, particularly paresis. In order to establish the "idiopathic" form, in infancy, trauma to the head from forceps delivery or any other cause; in childhood, trauma and syphilis; after 30, alcoholism, syphilis conditions, and brain tumor; and in old age, arteriosclerosis, chronic nephritis, senile involution, apoplexy, etc.. must be eliminated.

45. **Definition.**—a. In the course of time, the conception "epilepsy" has had varying definitions and today there is no certainty where the boundary line should be fixed. Epileptoid occurrences

are among the most widespread of symptoms and have been observed in some 100 different conditions. In view of this, those seizures appearing, without characteristic background, and merely as a symptom in various diseases and disorders, are distinguished as "symptomatic" epilepsy. On the other hand, a disease characterized by seizures of a like nature but arising upon a definite personality background without discoverable cause other than the psychopathological is distinguished as "genuine or idiopathic." Yet despite closest scrutiny of the clinical pictures, it will often be difficult to decide whether one is dealing with a symptomatic or genuine epilepsy.

b. In the Lumleian Lectures of 1928, Dr. Collier says, "the occurrence of epilepsy in connection with every conceivable variety of local disease of the cerebral hemispheres is a difficulty in the conception of a fundamental factor for epilepsy in a disordered metabolic state. The organic epilepsy has for the most part been considered as something quite separate and apart from idiopathic epilepsy, and as having a different clinical aspect and etiology, and requiring a separate description, and as amenable to surgical methods of treatment. This opinion, which is still widely held, has, I am sure, impeded the progress of our knowledge of epilepsy, for there is in reality no difference whatsoever between the clinical manifestations of epilepsy resulting from organic disease of the nervous system and those of idiopathic epilepsy."

c. Epilepsy may be defined as a symptom complex characterized by a tendency toward mental infantilism, with symptomatic manifestations occurring as occasional, sudden, excessive, rapid, local discharges from some center, sensory or motor. The discharges occur independently of volition and are accompanied by interference, partial or complete, with the stream of consciousness.

(1) Certain of the statements require explanation. Naturally "the tendency toward mental infantilism" will be most striking in those pronounced epileptics whose development has been interrupted so frequently by seizures that they are reduced to a condition of semi-invalidism. Obviously, also, the native endowment will largely influence the extent to which the subject regressively expresses infantile reactions. If there was defect with respect to ability to acquire knowledge and react normally to situations, then so much the more will such an individual under the convulsive handicap tend to react primitively and instinctively. Such defect of acquisitiveness and adaptability may be acquired owing to the limitations concerning opportunity imposed by the disease. In either case, the psyche undergoes a change of a distinctive stamp, resulting in what has come to be called the epileptic character. Even in those numerous milder cases in which the interruptions to development are less frequent and in which the greater

manifestations of this peculiar character are lacking, its finer shadings are none the less discernible on careful analysis. In the symptomatic forms, the mental picture will be that of the disease in which the seizure has the value of a symptom only, for in such cases one is not dealing with the disease epilepsy which has psychic features peculiar to itself. It should be borne in mind that an epileptic in whom the first attack appeared after the completion of schooling, and in whom the attacks are few and far between, may reach a high order of accomplishment; for example, Julius Caesar, Mahomet, Peter the Great, Swedenborg, Napoleon, Flaubert, etc.

(2) Anyone familiar with epileptic seizures will admit that the discharges are sudden, excessive, and rapid. The word "occasional" is introduced in order to exclude discharges not of this order; for instance, the interrupted continuous discharges of the chorea. The word "local" is justified by the fact that while the features of an epileptic attack differ in different cases, they are similar in the same case. Thus each individual patient invariably experiences the same kind of aura, falls on the same part of his body, bites the tongue in the same place, and utters the same sort of cry in successive attacks. And it is of peculiar interest to the student of mental disorders that if the individual exhibits mental disturbance either before or after a fit, it is of the same character with successive attacks.

(3) With respect to all that is implied by "discharges from some center, sensory or motor" there has been much discussion. The convulsion is said to be a form of cortico-motor release. So long as the organism functions normally, the cortico-motor release flows as a rhythmic energy tide. In the epileptic attack, there is interference with this rhythmic release; an inhibition of release showing as an impairment or interruption. Much has been written concerning the precise nature of what occurs.

(4) Foster Kennedy states, "It is a simpler task, however, to say what epilepsy is not, than what it is. It has already been described as an occasional paroxysmal discharge of a nerve center or group of centers occurring apart from volition and accompanied by interference with consciousness. Perhaps 'impairment' might be a better word than 'discharge', for many of the minor manifestations have such negative characteristics as to preclude the use of so positive a descriptive title. Even in the major seizure, the sequence of events can be most readily understood as a sudden cutting out of the highest level, the cortex, allowing the lower neuron levels to pour down an ungoverned stream of tonic postural impulses; in fact, an abrupt rigidity of the decerebrate type. The subsequent convulsions which

have secured, by their dramatic quality and their greater duration, more attention than I think they deserve, probably represent the gradual return of cortical control, incapable at first of ordered volitional action. I suggested at the beginning of this paper that many diverse causative conditions must operate through a common mechanism to produce so constant a result, and that the differences in the various manifestations of epilepsy, from the major seizure through petit mal, to migraine, to recurrent syncope and periodic endogenous emotional tempests, comprise nothing less than a qualitative and quantitative unity. And in the gamut I should include, without equivocation, the voluminous mental states of unreality, and those prolonged and terrifying experiences known now as vasovagal attacks in which the patient is suddenly terror stricken, suffers mediastinal oppression, has a feeling of tingling and swelling of the limbs, a sense of impending death, and losing precision of contact with his surroundings, experiences an acute transient seizure of cardiac hurry."

(5) One authority believed "idiopathic epilepsy far too difficult a subject for precise investigation unless we approach its consideration from the bases supplied by the principles deduced from the less complex kinds of cases. Probably the mechanism of the major attacks will be revealed by a study of the manifestations of the minor attacks which will be found, I think, to be fragments of the fully developed seizure—just as we have fragments of the decerebrate posture produced by imperfect mesencephalic block, so we may have fragments of the great fit produced when abnormal conditions, probably of a vascular nature, are not sufficiently violent to unseat the entire cortical function. The vasovagal attack which I have just described, if condensed in point of time, would be the same as the phenomena of many of the petit mal attacks."

(6) That the discharges occur independently of volition must be granted even in those psychopathological cases in which the individual defensively expresses such abhorrence of reality as to obliterate it and regressively react along the lowest levels of organic response. No one will question that the interference with the stream of consciousness is absolute in grand mal. But in petit mal and the minor equivalents this interference may range from a momentary "absence", through a transient diminution in the form of twilight thinking, to a fleeting disturbance seen as the obtrusion of an irrelevant thought.

(7) Since the epileptic problem is entirely unsettled it may be helpful to quote other definitions. One authority says, "epilepsy is a disease in which there occur repeated transient attacks of either a psychic, sensory, or motor nature, with a loss or impairment of con-

sciousness. The essential feature of epilepsy is a repeated and sudden loss of consciousness with or without a convulsion, and without apparent immediate cause." Gaupp says, "by epilepsy we understand a chronic, usually progressive disease of the brain, the main symptom of which is a disturbance of consciousness, appearing suddenly and in the form of attacks. Motor and other irritation phenomena are common but by no means present in all cases. Besides the transitory attacks symptoms which often, but not always, occur periodically, there appears in the majority of cases a gradual transformation of the entire psychic being, which sometimes chiefly affects the character, in other cases the intelligence as well of the patient (epileptic degeneration), and in the severer form of the disease ends in terminal dementia of a high degree and peculiar coloring." Noyes states that the term "epilepsy" is applied to various symptom complexes of a recurring paroxysmal nature, usually involving disturbances of kinesis, particularly in the form of convulsions.

46. Etiology.—*a.* Some authorities think the term "genuine epilepsy" should be abandoned. They regard it as an organic cerebral disease, the morbid anatomy of which is not yet understood. One says, "in considering the epilepsies there is no ground for defining 'genuine epilepsy' as an isolated group except that in the other groups, causative factors have been already discovered." Others believe there is a genuine epilepsy without discoverable cause other than the psychogenic, and that it is a form of degeneration having its roots in the congenital constitution. In any event there must be an inherent instability of nerve centers unduly favoring release of a mechanism permitting "the pouring downward of an ungoverned stream of postural impulses." The evidences of such release may range from the "dramatic gesture of the major seizure, through the less intrusive features of petit mal, to the most unobtrusive and momentary minor manifestations." And it is concluded the releasing mechanism is the same whether the cause is organic or psychogenic because the manifestations are similar and it is impossible in many instances to distinguish between the "symptomatic" and "genuine" convulsive attack, short of weighing all considerations and making careful study of the personality make-up. However heterogeneous and elusive the provocative conditions may seem to be, it is vital to recognize the essential unity of all attacks of loss or impairment of consciousness, with or without convulsions, or as has been stated, "The initial and essential event in every epileptic attack is a cessation and loss of function. All positive phenomena such as hallucinations and convulsions being referred to as 'release phenomena' occurring in lower levels of the nervous system no longer under control."

b. If a "genuine epilepsy" is conceded, then it must be admitted little is known about its cause although much importance attaches to a burdening psychopathic heredity which expresses itself along lines of degenerative modification by way of the epileptic convulsive aptitude. However, the present tendency is to lay less emphasis than formerly on heredity. It probably plays a part in about 25 percent of cases, although epileptic persons may have normal children while entirely healthy parents may have progeny afflicted with epilepsy.

c. Factors noted in the ancestors of epileptics have been alcoholism, the vague term "neuropathic diathesis", parental syphilis, influence of mother's health on intra-uterine life, endocrine disturbances, and nervous and mental disorders. In such offspring, physical and mental stigmata of degeneration are common. Abnormal skull; asymmetries of the cranium and face; abnormalities of the palate; broad, heavy nose, and thick lips; visual anomalies; dilated, unequal, and irregular pupils; strabismus; abnormal ears; and anomalies of the teeth and growth of hair are frequent. Some are definitely retarded while in others the psychopathic personality is apparent before attacks occur. In fact, there are epileptics who never have an attack within the ordinary meaning of the term. On the other hand, the distinctive personality changes may be acquired in organic cases because of the limitations in the way of development and opportunity imposed by the disease.

d. Acting upon the inborn predisposition, secondary predetermining factors operate to produce the attacks. Among these are trauma to the head or any part of the body, although only 5 percent of those who received gun shot wounds of the head in the last war developed epileptic reactions. Others are noted as due to the influence of endogenous or exogenous toxins, anaphylactic reactions, the glands of internal secretion, circulatory disturbances especially anemia of the brain, hyperpnea, and the hydrogen-ion concentrations of the blood. Finally, the psychoanalytic theory should be mentioned as advanced by one authority, that the attack represents a flight from reality in response to an unconscious conflict, and is a regression to an infantile level or even the intra-uterine pleasurable state.

e. The difficulty of establishing the cause of epilepsy has been tersely stated as follows: "Anybody who is looking for one cause of epilepsy might as well stop looking." It would be informative if it could be known what actually takes place in the brain during an attack. When it is considered that these causes involve anatomical, physiological, physiochemical, and psychopathological processes, it may be concluded, as do a large group of psychiatrists, to consider epilepsy as the psychobiological life reaction of an inadequately equipped indi-

vidual to psychic stresses within and to psychosocial strains or environmental realities without, an adjustmental psychobiological reaction which becomes habitual with the personality tending to suffer a permanent deterioration. (Noyes.)

47. Pathological anatomy.—*a.* While anatomic changes are demonstrable in the brains of epileptics, none has been found which is uniformly characteristic. Alzheimer concluded epilepsy to be a group of various diseases; that a variety of conditions were capable of releasing the convulsive mechanism. He differentiates six groups of different processes. The first group comprises genuine epilepsy, the causes of which are not yet known; the second, he ascribes to external poisons and finds corresponding anatomic changes; the third, is syphilitic epilepsy dependent on endarteritis syphilitica of the smallest cortical vessels; the fourth, is arterio-sclerotic late epilepsy; the fifth, is found in focal diseases, especially encephalitis; and the sixth, is epilepsy in case of inhibition of the development of the brain.

b. Dr. Collier's latest contribution in the Lumleian Lectures for 1928 is as follows: "So far as the so-called 'idiopathic' epilepsy which thus affects man and animals is concerned, no pathological changes have been found upon which any hypothesis as to the nature of epilepsy can be built up. The findings have been for the most frankly negative, or such changes as have been found in severe and long-standing cases as may be reasonably attributed to long-lasting disorder of function. Attention has therefore turned to the possibility of finding an explanation of epilepsy in some perversion of the chemistry of life—some metabolic dyscrasia which may lead to the presence of substances within the system which act upon the nervous system as do the convulsant poisons and which may further, by depriving the nervous system of its customary activators, cause in some cases, a progressive impairment of the higher functions of the nervous system." However, the pathology and pathogenesis of the convulsive state are only a little less understood than its etiology.

c. Sclerosis of the cornu ammonis is found in about 50 percent of epileptic brains. but whether due to cause or effect has not been determined. Vascular changes have been noted in the cortex as have arachnitis, thickening of the pia, and thickening of the skull, but again whether due to cause or effect is not known.

48. Symptomatology.—Four groups of phenomena must be considered; those preceding the attack; comprising the attack; following the attack; and occurring between attacks which embrace the episodic occurrences known as "epileptic equivalents" and the permanent personality changes forming the "epileptic character."

a. Phenomena preceding the attack.—(1) These include the prodromata or more “distant heralds”, lasting from a few hours to a few days; and the real aura or “signal symptom” lasting only a few seconds, or from 1, to 2, or 3 minutes. The more distant heralds consist chiefly of changes in mood and behavior, showing as irritability, unsociability, depression, excitement, euphoria, delusions, and disinclination to do any work. These prodromata may appear with such regularity that relatives, associates, or attendants know an attack is imminent. The aura may occur as a sensory hallucination which may be auditory, visual, olfactory, gustatory, cutaneous, or visceral; or it may be motor, psychic, vasomotor, or secretory. The sensory hallucination may be of any variety capable of being aroused in the particular field or fields involved. Motor, psychic, vasomotor, and secretory auras require more detailed description. The motor aura usually starts as a twitching of a single muscle or group of muscles gradually extending to other muscles; or there may be merely a tonic contraction of a muscle or group of muscles; in either event, usually not extending beyond a portion of a limb or one whole limb before consciousness is lost. Sometimes the head is rotated to one side, or the eyeballs turned to one side, or there is mere fluttering of the lids. It is rare for bilateral motor irritation to precede the attack. There may be dysarthria, aphasia, moistening of the lips, swallowing movements, yawning, singultus, crying, singing, whistling, etc. The patient may turn around rapidly, or run forward, backward, or in a circle. Not infrequently children will run to their mothers crying as if for protection. Psychic auras are exceedingly varied and may be either vivid or vague. They occur as a depression, a fervor, a doubt; an impulse, as gaiety, rage, or quarrelsomeness; as a sudden recollection or instantaneous review of a lifetime; a vague, dreamy state, or feeling of strangeness and unreality. Vasomotor auras occur as flushing or pallor; erythema, urticaria, ischemia, or angioneurotic edema. Secretory auras may occur as profuse perspiration, salivation, or more rarely gastrosuccorrhoea.

(2) The attack may or may not be preceded by prodromata or by an aura. No statistics are available concerning the former, but the latter occurs in about 50 percent of cases although not in 50 percent of attacks. It is an interesting fact that attacks may often be aborted by assault upon the aura if it is sufficiently prolonged, especially if located distally. It must, therefore, be clear that an epileptic attack instead of invariably occurring with lightning-like abruptness as is popularly believed may be announced by prodromata, an aura, or both. Since an aura may last from a few seconds to as long as 3 minutes, it follows that epileptics, experienced concerning their

attacks, may have time to lie down and avoid injury. Just as the hysteric falls without injury, so may an epileptic, under the conditions described, ease to the floor or go and lie on the bed. Thus a mother might place her baby in the crib and then lie down in any convenient place before consciousness is lost. Gowers says, "Swiftness is an essential element of ordinary epilepsy, but this does not preclude the possibility of deliberation."

b. Phenomena comprising the attack.—These include grand mal or the major attack; petit mal or the minor attack; and in a sense, abortive or larval attacks; the latter is described in *d* below, in connection with epileptic equivalents. Some patients have only major, others only minor, attacks, but frequently they have both; or major attacks may be replaced by minor attacks, or vice versa; or either become abortive, and grade downward into the less obtrusive manifestations.

(1) *Grand mal or major attacks.*—These attacks exhibit three distinct stages; the tonic, the clonic, and the stertorous. The latter stage properly belongs with phenomena following attack which is described in *c* below.

(a) The tonic stage lasts from a few seconds to 1 minute and because of the very short duration may go unrecognized. It sets in abruptly, with or without apparent cause, with or without prodromata, premonition, or aura, and consciousness is instantly lost. (Consciousness is completely lost during the whole of the attack in most grand mals, at least for a part of the attack in all.) Since all the muscles of the body are thrown into tetanic rigidity, the patient not only falls, but frequently is flung down violently. Simultaneously, but after consciousness is lost, occurs the characteristic cry, shriek, or respiratory guttural sound due to the sudden tetanic muscular grasp of the thoracic and fixation of the laryngeal apparatus. The cry is not verbal, nor does it occur in all cases nor in all attacks. The face is pale, then congested, then cyanotic. Occasionally the pallor persists throughout the attack. The eyelids are usually open (but may be closed); the eyes fixed, turned up, or to one side; the pupils at first miotic, then mydriatic, with no reaction to light; and the conjunctival reflex lost. The inner surface of the cheeks or tongue or both may be caught between the teeth and lacerated. Instead of all the muscles being in tetanic rigidity, there may be only flexion of the fingers or toes, or fixation of a single muscle or groups of muscles, or of one-half of the body. Usually, however, the entire musculature is involved; the thumbs are adducted across the palms and grasped by the flexed fingers, the hands and elbows flexed, the

head retracted, the back arched, and the legs rigidly extended, or the more powerfully contracted muscles of one side may draw the body, head, and eyes toward that side. While the above is the usual position, exceptions occur. The fingers may be extended, the elbows flexed, and the arms raised; or the body may be flexed, with head forward and chin on chest, one arm and one leg flexed, the other arm across the chest, and the other leg extended. There may be almost any variation from the classical position. Spasm of the abdominal muscles may expel the contents of the bladder and rectum. A thrill or vibratory impulse can be detected by placing the hand on the tonically contracted muscles. Often minute vascular ruptures occur in the skin, mucous membranes, and conjunctivae, and it is probable that similar vascular accidents take place in the viscera and brain. It should be remembered all the above occurrences are condensed in point of time from a few seconds to 1 minute, and may be entirely overlooked by the casual observer.

(b) The clonic stage usually lasts from 1 to 5 minutes, and sometimes as long as 15 minutes. The tetanic rigidity is replaced by trembling, advancing to clonic movements increasing to rapidity, then becoming more powerful but slower and slower until finally they cease and the body lies in full relaxation. The eyelids will now likely close, but during the convulsive movements, they may alternately open and close. The clonic movements are not always of the same character; in general there is flexion and extension of the limbs, the head and trunk are tossed about with violence, the eyes roll, the face grimaces, and the tongue and inner surfaces of the cheeks may be bitten. Respiratory movements, momentarily interrupted in the tonic stage, now resume, diminishing the cyanosis, but are rapid and noisy and often accompanied by groaning or moaning noises. The increased saliva, instead of being swallowed or expectorated, is churned and forced between the teeth as bloody foam. Urine, feces, and semen may be expelled. Cardiac action momentarily interrupted in the tonic stage, now is rapid. The pupils are mydriatic and immobile, the cutaneous and deep reflexes absent, and ankle clonus and Babinski often present. The body and face are covered with perspiration but the temperature remains normal. (In status epilepticus, the temperature may rise to 107° . When status takes place, it usually does so as a continuation of a grand mal).

(2) *Petit mal or the minor attack.*—These fractional epileptic attacks last from a second to half a minute. They appear suddenly and occur in great variety, with or without falling, with or without motor twitching. Gowers mentions 70 different manifestations of petit mal. The constant factor is a momentary loss of consciousness

but this does not preclude subsequently concluding something unusual had occurred. While an attack may occur after an aura, it is very rare for an aura to precede. In the commonest form, the face suddenly pales (rarely flushes), the palpebral fissures widen, the pupils dilate, and the "gap" in consciousness shows as an interruption in conversation or whatever is being done, followed by immediate resumption without the subject realizing the "absence" or those around perhaps even noticing it. Or, in addition to the above facial changes, there may be slight twitching of the facial muscles, of the eyelids or lips, smacking, tasting, or sucking movements; spitting; dropping whatever is in the hands; twitching of one or more extremity; discharge of urine; or giving way of the knees and falling. Events such as these clearly indicate release of some deeply seated mechanism, but there is no real convulsion. Perhaps the slight jerks occurring while dropping off to sleep have similar significance. One must also think of attacks of "dizziness" and so-called fainting spells as not infrequently related to petit mal.

c. Phenomena following the attack.—The patient lies inert just as the convulsion left him, unconscious and breathing stertorously. Within a few minutes he opens his eyes, but appears dreamlike and confused. Presently consciousness is fully restored, but he is likely to be cross, irritable, and complain of a headache. Rarely there is abrupt restoration to consciousness and feeling of being as well as usual, or of feeling unusually well. More commonly the patient opens his eyes, without seeming to be conscious, and then falls into a deep sleep lasting for hours. The sleep is apt to be long after severe and short after mild attacks. If roused from the sleep (often impossible), he may get up and do apparently purposive acts, such as undressing movements, or be violent, without knowledge of it afterward. Vomiting may occur during and after an attack. Polyuria or nycturia may follow the attack. The blood and urine may be toxic. There may be transitory blindness, aphasia, stuttering, paraplegia, and various other disturbances. The mental state is apt to be one of dullness and stupidity due to exhaustion of the cortical centers; but the patient may appear bright as usual. There is complete amnesia for at least a part of an epileptic attack, and this may extend over a period preceding, but the patient usually at least remembers the aura and knows something unusual occurred because of feeling sore, strained, fatigued; the sore mouth, injury due to falling or the convulsive movements, urine, feces, etc. Only because of such experiences may there be reason for suspecting a night attack has occurred. Ankle clonus and Babinski persist for a while after the attack and the knee-jerk remains in abeyance.

d. *Phenomena occurring between attacks.*—These embrace the occurrences known as epileptic equivalents and the permanent personality changes forming the epileptic character.

(1) There are a number of striking disturbances which occur between, or in relation to, either major or minor attacks, called "epileptic equivalents". Some are abortive and transitory in the sense of their not being a complete convulsive manifestation; while others occurring as protracted mental disturbances are more strictly substitutive in character and of extreme legal and sociological importance. Others, as sleep talking or muttering, narcolepsy, migraine, momentary absences, fainting spells, vasovagal attacks, and attacks of dizziness are scientifically interesting to the psychiatrist as indices for epilepsy even in the absence of attacks within the ordinary meaning of the term. They form an ensemble, with or without the characteristic personality changes, making possible the diagnosis of epilepsy without history of convulsive seizure, as there are epileptic organisms which never "gesture" in dramatic fashion.

(2) Both abortive and protracted disturbances may precede, interrupt, take the place of, or follow an attack; or occur independently of anything strictly resembling a convulsive seizure. The amnesia for these disturbances may be partial or complete. No hard and fast line can be drawn between the abortive or transitory and the protracted disturbances; the former may be classed as those lasting from a few seconds to a few hours and the latter as those lasting days, weeks, or even months. The terms, "psychic epilepsy", "epileptic twilight states", "epileptic automatism", and "epileptic fugues" are generalizations somewhat loosely used to include practically all the conditions. In evaluating the abortive disturbances those transitory changes are seen as unmotivated ill-humor, anger, depression, excitement, euphorism, or confusion related to attacks in time as preconvulsive or postconvulsive; or more obscurely taking their place in masked or rudimentary fashion—additional proof of relation in fact resting upon observed or unobserved motor twitchings or other rudiments. In this connection, petit mal is a fragmentary seizure, abortive in the sense of its relationship to grand mal, the two conditions frequently occurring interchangeably or by gradation from one to the other in the same individual. Certain other transitory disturbances consist of impulsive acts of a violent, often criminal nature. They are—

(a) *Epilepsia procursiva*, in which the patient automatically performs movements of walking or running, often ending by running forward even several miles as if impelled by an irresistible force, perhaps striking any body happening in his way.

(b) *Epilepsia retropulsiva*, in which the patient performs movement of walking or running, often ending by running backward.

(c) *Epileptic furor*, in which there is an ungovernable asocial impulse leading to indecent exposure, assault, theft, arson, rape, or murder; in connection with the last two, acts of revolting brutality are often committed all absolutely unmotivated and without distinction as to time, place, or person.

(3) Protracted disturbances last for days, weeks, or even as long as 2 or 3 months. No hard and fast line can be drawn between the transitory and protracted disturbances for the difference is practically that of duration only. Hence when prolonged beyond a few hours they become states of—

(a) *Epileptic depression or ill-humor*, in which the subject is irritable, querulous, complaining, and antagonistic; nothing pleases, nor does any one understand or sympathize; he is very hypochondriacal, and threatens or attempts suicide. Some authorities teach that real dipsomania is an epileptic manifestation because it arises in a peculiar mood of depression; and that the dipsomania attack under the influence of alcohol gradually passes into a severe twilight condition from which the patient awakes with total or partial amnesia.

(b) *Epileptic excitement*, in which the subject laughs immoderately, strips, somersaults, declaims, speaks irrationally to bystanders, or addresses inanimate objects; or the aspect becomes forbidding and there arises passionate fury and violence expending itself in wanton destructiveness; or in criminal acts, as assault, theft, arson, rape, murder often with revolting brutality or bestiality, "Ripper" crimes, or epileptic furor.

(c) *Epileptic confusion*, with imperception and disorientation, and aimless wanderings or purposeless movements of the arms and legs. Stoddard mentions one such case in which there was remarkable suggestibility. The patient was in a London hospital, but said she was near the sea because she heard the sound of the waves which was in reality the noise of traffic. The patient's suggestibility had doubtless been heightened by being demonstrated to a class of students. In any event, Stoddard impressively told her that in one week she would hear a crack in her head, and suddenly recover. Exactly one week later she did hear a crack in her head and returned to her normal condition. Says Stoddard: "the kudos I had obtained for remarkably clear insight into the patient's malady was ill-deserved. The result was probably due to the patient's unsuspected suggestibility; it could hardly have been a coincidence."

(d) *Epileptic delirium*, in which the subject has terrifying hallucinations and the delusion of a hostile environment. Or the halluci-

nations and delusions may have religious import. Celestial beings appear and perhaps speak, so that the patient sings or kneels in prayer.

(e) Epileptic stupor, often called "epileptic catatonia" because of its resemblance to catatonic stupor.

(f) Epileptic automatism, consideration of which introduces many interesting questions concerning double or alternate consciousness, because the manifestations may range from a single automatic act to the ambulatory fugue lasting days or weeks during which the behavior is so apparently normal and natural that the unusual state is unsuspected. The single automatic act often consists of undressing movements in public. Gowers explained this "as due to some vague sense of indisposition and the propriety of going to bed." Stoddard sees it "as the gratification of an unconscious desire to expose the body to public gaze." All these conditions begin and end suddenly and are most common after petit mal. The amnesia may be partial or complete. Several striking illustrations of epileptic automatism are as follows: "Without mishap a man drove a dray through crowded thoroughfares, across London, and found himself 6 miles from the place where he was, as it seemed to him, a moment before." (Gowers.) "A bank clerk was sent with a message to another bank, having entered which, he knocked a clerk off his stool, disarranged some papers but removed none, and left the bank. Subsequently he remembered nothing of the incident except experiencing his usual epileptic aura on ascending the bank steps." (Stoddard.) "There is the classical case of the French judge, who, after an attack of petit mal which occurred during a trial, micturated in a corner of his court before the public gaze, an incident of which he could subsequently remember nothing. (Stoddard.) Occasionally, however, these post epileptic states are remembered by the patient. "A man who worked in a shipyard and had for some years been subject to attacks of giddiness with increasing frequency, went to the yard as usual one morning, did some work, and then went and sat down on a piece of timber. His comrades spoke to him but could get no answer, so he was taken to a hospital. While there he would say nothing except the Lord's prayer, in reciting which he showed some difficulty in articulation. After a sojourn of a few days he was transferred to an asylum where he became almost immediately his normal self, and was able to recount all that had happened to him in the hospital, knew the names of the doctors there and related incidents which occurred during demonstrations of his case to students. After a few days he relapsed and became an ordinary case of epileptic insanity." (Stoddard.) "A patient was sitting before me, and just as I was about to make an

ophthalmological examination, the pupils suddenly dilated, the face became expressionless, the palpebral fissures widened, while the patient suddenly unbuttoned his vest and trousers, put his hand in his pocket and withdrew his knife, opened the large blade, and grasped it as if with the intention of stabbing. His muscles then gradually relaxed, his shoulders dropped, he folded his knife and put it back in his pocket, and he had no knowledge of having had the attack when questioned about it." (Block.) "One of my patients walked 40 miles to a neighboring town and on recovery from the attack, knew of only two facts which he could associate with the trip; on entering the hotel of his home town to keep an appointment, consciousness ceased at the door of the hotel and it had returned while he was standing on the doorstep of a house in the neighboring town, his hat in his hand, while a lady instructed him how to reach some point in the town, although he knew nothing of what he had asked her. He had suffered from frequent epileptic convulsions, and this one was replaced by psychical epilepsy." (Block.) Professor James of Harvard University, recites the remarkable case of the Reverend Ansel J. Bourne. This man, a carpenter and itinerant preacher, then 60 years of age, disappeared from his home in Rhode Island on January 17, 1887. With abrupt restoration to normal consciousness on March 14, he found himself keeping a confectioner's shop, under the name of A. J. Brown, in Norristown, Pennsylvania. No one who had known him in Norristown had suspected there was anything wrong with him. There was absolute amnesia for the whole period, and vice versa, during the period for the whole of his past life. His history showed him to have been of average endowment and of unblemished character. There had been a significant episode in his thirtieth year, interpreted by himself and friends as a visitation of Providence. One day while walking in the open country he heard a voice saying, "Go to the chapel!" He inquired, "What chapel?" The voice said, "To the Christian chapel." But the carpenter was on unfriendly terms with the pastor of the chapel and exclaimed, "Before I go to that place I hope God may strike me deaf, dumb, and blind." Whereupon he fell to the ground, enveloped in darkness and silence, and without the power of speech. Presently he was restored to his senses and the matter culminated in his conversion and becoming an itinerant preacher for the next 25 years. One wonders with what embellishments the preacher narrated this tale in after years to his audiences. Professor James repeatedly hypnotized the Rev. Ansel J. Bourne and each time got a detailed account of the doings of A. J. Brown. In addition, he recalled having been apprehensive concerning some sort

of trouble at home, having drawn money from the bank and going away. He spent a night at the Grand Union Hotel, New York City; next day went to Philadelphia, was at a boarding house on Filbert Street for two days; saw the advertisement of a store for sale in Norristown, went there, purchased it and set himself up in business. All of which was duly verified. Professor James stated that his Brown personality was a weak, insipid, diluted extract of his normal self. After being hypnotized many times, his hypnotic memory grew more and more feeble until finally he could recollect only the faintest outlines of his abnormal state.

49. **Epileptic character.**—*a.* In addition to being a serious physical disease, it must be emphasized that genuine epilepsy is likewise a mental disease. In those cases with but few and isolated attacks, and in which the first did not appear until after the completion of schooling, assuming also an average original endowment, there may be little or no effect upon the mental life. Under such circumstances, epilepsy is not incompatible with full mental vigor and usual or even exceptional accomplishment. Certain famous men were epileptics. In explanation, it has been urged that the consciousness of insufficiency aroused a defense reaction spurring them on to greater endeavor, culminating in brilliant compensation. However this may be, the picture has its darker side. Since the greatest incident is in the earliest years, and since the majority of epileptics begin life under a burdening psychopathic inferiority, they are inevitably handicapped by the three-fold factors—disease, inherent defect, and limited opportunity. These unfortunates illustrate the damaging influence of the uncompensated inferiority complex, for most epileptics gradually relinquish the struggle and accept defeat, becoming idle, dependent, and deteriorated.

b. It is to be expected that the chronic changes in personality will show variously in different subjects. Nor are all the peculiarities seen in epileptics to be interpreted as epileptic symptoms: other contributing factors may be operating. Nevertheless the disease seems, in typical cases, to cause specific changes in the psyche. The character deteriorates. The patient becomes irritable, stubborn, spiteful, quarrelsome, pedantic, petty, untractable, untruthful; is taciturn or loquacious, moody or euphoric; has hypochondriacal ideas, is given to fawning politeness, and gradually becomes more and more egotistic. He is boastful, praises himself and family, notwithstanding he is apt to be quarrelsome and a most disturbing element in the family life, disposed to make trouble for others and get sympathy for himself. In some, the ethical and esthetic sense dulls; in others there is a sort

of religious emphasis, a kind of "righteousness", in reality, however, a superficiality, a vapid piety.

c. With respect to the intellectual content, epileptic thinking has something unclear and indefinite about it. The mental stream is retarded and runs heavily. He is verbose, clumsy, and vague in speech, fails to get anywhere in his talking, depicts all trivialities in repetition and in manifold expression of the same idea in different forms. He dwells on the simple and the present and what immediately concerns himself, has gormandizing habits, is careless, indifferent, and notoriously unreliable. There is poverty of ideation, with small vocabulary and word reactions of the infantile sort; memory defect, diminished impressibility and comprehension, and impaired judgment. The patient evinces peculiar slowness, ceremoniousness, mental backwardness, and dearth of thoughts. The whole tendency is regressive and the picture a curious composite of adultism and infantilism. The affectivity is morbid. The patients are clinging in their attachments, given to emotional oscillations; resentful if unnoticed; like children joyful if praised, heartbroken if rebuked; they busy themselves about the wards without getting much done and their clumsy readiness often becomes a nuisance. They are self-centered, egotistic, auto-erotic and narcissistic; often showing exaggeration or perversion of the sexual impulse.

d. When it is remembered that epileptics lead an interrupted school life, are restricted in their social contacts, have difficulty in holding positions, suffer inhibitions concerning marriage, and are apt to be pitied, just tolerated or even shunned, it is inevitable that personality changes such as the above should occur in varying degrees and extent in accordance with the severity of the case and associated factors, inherent as well as environmental.

50. **Clinical varieties.**—In addition to symptomatic and genuine idiopathic epilepsy; grand mal and petit mal; serial epilepsy and status epilepticus; epileptic equivalents, including psychic epilepsy, twilight states, automatism, and fugues; epilepsia procursiva and retropulsiva; abortive or larval forms; nocturnal epilepsy; and porio-mania or wandering epilepsy, there are several other varieties, principal among which are—

a. Uncinate fits, in which there are smell or taste sensations with smacking or chewing movements, associated with a dreamy, confused state, and often a sense of fear.

b. Narcolepsy, suddenly falling into a deep and prolonged sleep during the day with amnesia for the period immediately preceding. Usually classed with the equivalents.

c. Jacksonian epilepsy, in which there is a localized spasm at times associated with a loss or impairment of consciousness and at times developing into a general convulsion.

51. *Sequelae*.—The most common and important of the sequelae is mental deterioration. Its degree usually is in direct proportion to the frequency of attacks. Mental enfeeblement is more often associated with petit mal than with grand mal, and the prognosis is worse. The extreme of mental deterioration is seen in epileptic dementia which may become as complete as the terminal dementia of paresis, existence being purely vegetative.

52. *Prognosis*.—There is a general impression that epilepsy is incurable or at least cured but rarely. Perhaps this is due to "one method" forms of treatment and failure in all cases to make systematic search for cause. The disease is due to an unstable nervous system plus a cause. Ten percent is usually given as the proportion of cures. It is preferable to speak of the disease as arrested rather than cured, because of the liability of recurrence even after a long interval. The prognosis is better if treatment is begun soon after the first attack in cases preceded by an aura, if the attacks are severe and far apart, and if they occur only during sleep or only while awake. The attacks often cease during pregnancy and the infectious diseases, usually reappearing after convalescence. One well-known author feels that "if, after a patient is treated for 2 years without the occurrence of a fit, and the treatment is then gradually reduced and no fits occur for a year after treatment is stopped, the patient may be considered cured. It is not, however, claimed that the patient now has a perfectly stable nervous system and that he will never again be subject to any of the various functional nervous diseases, for in reality he will be more subject to them than a normal person as long as he lives, and among these diseases he will be subject to epilepsy. The prognosis naturally carries out the general hygienic measures, diet, and treatment." Death often occurs through vascular accident, by suffocation or other physical mishaps attending a fit. Status epilepticus is apt to terminate fatally. Pronounced epileptics are short-lived. Only about 3 percent reach their fiftieth year.

53. *Diagnosis*.—a. Since some epileptics never make the dramatic convulsive gesture, the diagnosis must often rest on evidence presented by less intrusive manifestations such as equivalents and personality changes. Even when there is history of a seizure or seizures, the physician may not have opportunity for observing one, and the patient's statements are of no value for presumably he was unconscious. If he relates anything, not hearsay, as having occurred during a fit, then it was not epileptic. However, this is not to be

held conclusive with respect to some equivalents, notably a fugue, as there might be islets of memory. While it would be unwise to belittle the importance of a convulsion, yet it has the value of a symptom only, occurring as it does in some 100 different conditions. More significance attaches to the momentary and less insistent gestures, to the more obscure equivalents, and to the character changes. In occurrence (isolated, repeated, or in ensemble) they are presumptive for the disease epilepsy and have the weight of proof despite absence of attacks.

b. Age is an important diagnostic factor inasmuch as three-fourths of genuine epilepsies occur before the twentieth year, with the greatest incidence during infancy. Hence a first occurrence toward 30 or later should arouse suspicion of organic disease; if in the thirties, of syphilis; in the forties or later, of alcoholism, lead poisoning, or arteriosclerosis. There remain many obscure cases, however, in which diagnosis is difficult, even impossible, unless the patient be in the ward under observation. Even then the case may be atypical and the symptom complex confusing because in its spectrum lie colors belonging elsewhere. The epilepsies are not so poor in resource that they disdain appropriating manifestations from related disorders.

54. Differential diagnosis.—The principal problem is that of differentiating genuine epilepsy from hysteria. A thorough knowledge of each disorder should make this positive in practically all instances, although some authors say there occur those in which it is impossible. There are instances in which it is practically impossible to decide whether the seizure is epileptic or hysteric. It has been claimed there is a "hystero-epilepsy"; and further, that there occur attacks which should be considered "intermediate" between the epileptic and the hysteric. Obviously, a hysteric eventually might, because of trauma or disease, present symptomatic epileptic attacks. Conversely, an epileptic might exhibit certain hysterical symptoms. Or the manifestation may be so indeterminate as to seem a composite standing midway between the two. A knowledge of epilepsy, particularly with respect to the momentary "absences" and other minor equivalents, as well as amnesic states following head trauma, is of vital importance to the flight surgeon. While these phenomena interest every physician, their occurrence on the ground may not involve special hazard. In the air, however, it may cost a life, or lives; and the responsibility will rest directly upon the flight surgeon who failed to discover the defect. Further, the potentiality for momentary "absences" and automatisms lurks in every individual

who has sustained a severe head trauma and the examiner must have this possibility in mind before again qualifying for flying duty the pilot who has sustained such injury. Nor is it safe to disregard a possible latency in this direction which may become a manifest symptom, even months afterward. There is increasing interest in the so-called equivalents, migraine, narcolepsy, pyknolepsy, vaso-vagal attacks, syncopal attacks and tetany, which, it is becoming more and more the belief, are caused by the same condition—a metabolic dyscrasia, now considered by most authorities on the subject as responsible for the epilepsies, and which flight surgeons should constantly be on their guard to recognize in the original examination of applicants for flying training, in order that they may be rejected.

a. Epilepsy.—(1) Usually arises without any demonstrable cause, psychological or otherwise.

(2) Consciousness completely lost for the whole of the attack in most instances, at least for a part of the attack in all.

(3) Sudden involuntary falls, injuries, and bitten tongue.

(4) The self injuries are unfortunate accidents.

(5) Makes no sound after the initial respiratory cry, although they make moaning or groaning sounds during clonic stage.

(6) Eyelids open, or alternately open and shut; eyes fixed, turned upward, or to side; pupils at first miotic, then mydriatic, no reaction to light; conjunctival reflex lost.

(7) Cutaneous and deep reflexes lost; ankle clonus and Babinski toe reflex present; both persist for short time after attack.

(8) Face pale, then suffused, then cyanotic; pallor may persist throughout.

(9) Tonic-clonic stages; in general, the movements are those of reflection and extension and they are continuous, not interrupted by rest periods.

(10) Occasional involuntary micturition and defecation.

(11) Not induced by external stimuli, nor can the course be influenced by interference. As to the latter, however, some attacks can be aborted by interference with the aura; when it occurs in one of the limbs, by constricting or manipulating it; swallowing a pinch of salt, startling the psyche, etc.

(12) Manifestations uniform in successive attacks in the same individual, but different in different subjects.

(13) Duration rarely more than 15 minutes; subsequent headache, somnolence, muscular fatigue, and amnesia.

(14) Falls in convulsion whether observed or unobserved, even where conditions threaten life.

(15) Epileptic character wholly different from the hysteric.

(16) Characteristic mental deterioration in typical cases.

(17) Never simulates any other form of disease.

b. Hysteria.—(1) Reaction to a psychic excitement; psychic processes are responsible for its excitation and further development.

(2) Consciousness rarely completely lost.

(3) No sudden involuntary falls, injuries, or bitten tongue, unless accidental or by way of demonstration.

(4) Self injuries, when occurring, are intentional, but this does not preclude an accidental injury.

(5) Often there is talking from time to time, or even crying or laughing.

(6) Eyelids usually tightly closed (may be open), but may covertly open them and look around; if lids are forcibly separated, eyes will be found rolled upward.

(7) No reflexes lost; ankle clonus may be present, Babinski never.

(8) Face pale, unchanged, or suffused; never cyanosed.

(9) No tonic-clonic stages; sometimes tonic rigidity throughout; more frequently a tumult of emotion. In general, movements of expression coordinated in character. The patients pound, hammer, push, tread, often quite rhythmically. They struggle, toss the arms and legs about; opisthotonos; periods of rest, then more convulsions, biting of the lips, hands, bed clothing, bystanders, but not the tongue. Urination and defecation do not occur except intentionally.

(10) Emotionalism arising either internally or because of external influences. Attacks are usually susceptible to external influences so that the physician may place himself in contact with the patient during the attack and influence the course of the individual phases. Attacks may be abruptly terminated by strenuous treatment.

(11) Manifestations diversified and extravagant, and without uniformity in successive attacks.

(12) Attack may last for hours, and patient be surprisingly alert and well immediately afterward. Amnesia for attack very rare, but it may be claimed.

(13) Tendency to pose, play a role, and incite sympathy causes him to stage a fit where there is an audience, not necessarily a conscious theatricalism.

(14) Hysteric character wholly different from the epileptic.

(15) Hysteria never leads to mental dullness.

(16) Hysterics are great imitators and may simulate various forms with such perfection as to make detection extremely difficult. This is not necessarily conscious imitation.

SECTION XII

SCHIZOPHRENIA (DEMENTIA PRAECOX)

	Paragraph
General_____	55
Etiology_____	56
Pathology_____	57
General symptomatology_____	58
Characteristic symptoms_____	59
Types_____	60
Course and prognosis_____	61
Differential diagnosis_____	62

55. General.—Schizophrenia has perhaps excited more interest and speculation than any other form of mental disease, largely because it constitutes about 20 percent of first admissions to State hospitals and comprises about 60 percent of their population.

a. The onset may occur at any time from late childhood to the late middle age although the most frequent age incidence is found to be during adolescence. This is readily explained, as at this time the most perplexing life problems, as sex, religion, vocational and social life are met with, and those inadequately equipped have the difficult task of successfully emerging from this period.

b. To Kraepelin, in 1896, belongs the credit for separating this disease as a psychosis distinct from other allied forms of mental disorder and giving it the name "dementia praecox." Additional experience with this psychosis has led to the conclusion that the title "dementia praecox" is somewhat misleading, as the term itself indicates a disturbance or change of tissue which may be either structural or toxic. Again, the term does not indicate the outcome of the disease as it does not always lead to dementia but to deterioration in interests and habits, and an unfavorable outcome or prognosis is not always the result. (Noyes.)

c. Attacking the subject from the interpretative point of view, Bleuler introduced the term "schizophrenia," as he considers a splitting of the psyche the essential element, and its characteristic features to be due to a combination of psychic changes affecting the emotions, the will, and association of ideas, prominent among which is a dissociation of the affect, leading to withdrawal from contact and reality. It is an introversion psychosis and its roots are found in personality traits which are ordinarily manifest from early childhood and show as a tendency to be seclusive with small capacity for becoming emancipated from childish methods of reacting.

56. Etiology.—*a.* Schizophrenia develops in individuals probably predisposed constitutionally with a special personality make-up manifested by a personality disorganization occurring in response to the stresses of their life situations, the forms of which are determined in part by their innate psychological inadequacy, in part by their progressively faulty responses and unhealthful habits of thinking and feeling, and in part by psychological events and experiences. These psychological events and experiences include emotionally determined complexes and mental conflicts; forces which have long tended to disorganize personality.

b. In accord with Noyes, schizophrenia is considered as a personality disorganization occurring in response to the stresses of life situations in individuals probably predisposed constitutionally with a special personality make-up. With this observation in mind, there remain other less fundamental factors that may precipitate or contribute to the development of this psychosis. These may be classed as the so-called exciting causes and include such factors as age, sex, physiological epochs, environmental conditions, climate, civilization, toxæmias, bodily diseases, head traumas, physical and mental exhaustion, and emotional stresses. These are stresses common to all mankind. The mentally fit survive, while the mentally unfit make adjustments on levels increasingly lower until the stage of a definite psychosis is reached, depending upon the degree of constitutional defect and the severity of the precipitant.

a. These contributing factors are peculiarly significant to the therapist for they furnish valuable indications for bringing about an adjustment on a higher level than could otherwise be reached. These observations are predicated upon the assumption that an organism cannot function beyond its inherent capacity.

d. One authority believed in an inherent lack of vitality in the fertilized ovum. Another authority believes there are associated organic changes in the brain, however he admits that his findings are not definite enough to make a diagnosis. Because of the close association with puberty, the puerperium and the climacteric, emphasis has been laid on a possible toxic factor, probably some secretion of the gonads. Disturbances of acid-base equilibrium has also been accused, as has a decrease in the number of ganglion cells.

57. Pathology.—*a.* There is no general agreement as to whether or not brain pathology is present. Lewis calls attention to the aplastic circulatory system and a polyglandular sclerosis of the endocrine glands seen in a large number of cases. Authorities have found products of nerve-cell degeneration within nerve cells, in the clear spaces around them, and especially in the pervascular spaces. Ros-

anoff, observing the relationship between cranial capacity and brain weight, has found close correlation between the degree of mental deterioration observed clinically and that of atrophy found at autopsy in cases of schizophrenia; from this he has drawn the conclusion that "dementia praecox is associated in some way with changes in the brain which lead to atrophy." Another authority has also observed, in cases of clinical deterioration, reduction in brain weight and, by careful microscopic measurements, thinning of the second, third, and fifth cortical layers, especially in the prefrontal region.

6. Present day psychiatrists are of the opinion that there is no definite pathology that can be adequately ascribed as being the cause of schizophrenia. Noyes states that the causes must be found in complicated psychobiological forces such as intrapsychic conflicts, rejected demands of the instinctive urges, feelings of guilt, and other frustrated purposes usually found in individuals who easily give up the struggle with reality and find satisfaction in phantasy, hallucinations, and delusions.

58. General symptomatology.—a. (1) *Physical*.—

Circulatory apparatus.—Vasomotor disorders causing edema, cyanosis of the extremities, and dermatographia; localized sweating and dilated pupils are frequently present.

Digestive system.—Anorexia, bulimia, indigestion, constipation, and disordered metabolism may be present.

Motility.—Epileptiform and especially hysteriform attacks are frequently observed in the early stages. Contractures are as a rule the consequence of negativism.

Tendon reflexes.—Usually exaggerated.

Sensorium.—Often unilateral anaesthesia as in hysteria.

(2) *Mental*.—The schizophrenic patient creates in the mind of the observer an impression peculiar, distinct, and radically different from that of any other psychosis. Constrained, cold, passive, apathetic, and indifferent; remote, inaccessible, introverted, shut in; sufficient unto himself, yet without insight; he is withdrawn from reality into an isolation baffling approach.

Perception.—Inadequate and unclear.

Hallucinations.—Numerous and fleeting. In order of frequency, auditory, visual, haptic. Auditory most frequent at first, simple noises, then voices in quality disagreeable, disturbing, pleasant or nonsensical.

Consciousness.—Clear, except in excited and stuporous states.

Orientation.—Seldom disturbed.

Content of thought.—Shallow, showing intellectual enfeeblement.

Delusions.—Fantastic, grotesque, changeable; at first, depressive; later, expansive and grandiose. In character may be hypochondriacal, of sinfulness, persecutic influence, reference, exaltation, sexual matters, but never systematized. The delusions seem a contradiction of the emotional indifference. They ultimately fade as the mental activity decreases and the emotional indifference becomes more marked.

Train of thought.—A looseness and desultoriness superficially resembling flight of ideas. The thought is incoherent. Ideas entirely disconnected are associated. Pass without any connection from one subject to another. No logical ordering of the train of thought. Retardation or difficult thinking, a slowness in the elaboration of ideas.

Emotion.—Apathy, indifference, and lack of interest are among the earliest symptoms. There may be depression, sometimes alternating with exaltation. There is always in some degree emotional deterioration seen as lack of coordination between the intellectual and emotional reactions. Stransky calls this an "intrapsychic ataxia." There is a peculiar emotional dullness with uncertainty and senselessness of emotional response. This uncertainty and senselessness show in either of two ways: as an inadequate reaction, the patient merely simps or smiles when the occasion calls for hearty laughter; or as a contrasted reaction, he fatuously laughs when he should be sad. Emotions appear to dominate ideas. Patients are apt to cry with the eyes and laugh with the mouth. Stransky calls this "April weather behavior." These are aptly called paradoxical emotional states. On the other hand, there may be emotional neutrality; no grief and no joy, total loss of sympathy, no delicacy of feeling, no shame. Patients seldom worry, for owing to inadequate perceptions, no emotions are aroused.

Memory.—Not commonly affected except in advanced cases in which it becomes poor for recent events, good for events antedating onset of disease. This failure of memory for recent events is due to enfeeblement of powers of attention, to aprosexia.

Attention.—Failure of power of voluntary attention, there is marked indifference and lack of interest. Patients seem able to understand what is going on about them, without being able to show any real interest.

Personality.—Splitting, molecular instead of massive as in hysteria; more a fragmentation. There is a peculiar destruction of the internal connections of the psychic personality, the effects showing especially in the emotional and volitional fields.

Volition.—Disappearance of voluntary activity. There is loss of incentive to normal behavior; the patient sits idly about, negligent of person, dress, and the demands of nature.

Stereotypy of attitude.—Tends to maintain a particular, usually peculiar position.

Stereotypy of movement.—Exhibits mannerisms, such as repetition of same movement, usually meaningless.

Stereotypy of speech.—Manifests itself as verbigeration; the repetition of the same, usually senseless, words and phrases.

Negativism.—Passive, active, and auto.

Suggestibility.—Manifests itself as echolalia, echopraxia, automatism, and *flexibilitas cerea*.

b. The description in *a* above of the general symptomatology of schizophrenia suggests, in some respects, particularly on the volitional side, such absolute withdrawal from reality as to practically exclude awareness of the environment. Such a conclusion is erroneous, for an extremely negativistic subject will often surprise attendants and physicians by recalling occurrences that took place when, according to the most competent observers, his withdrawal from reality seemed so absolute as to preclude the possibility of noting occurrences about him.

59. **Characteristic symptoms**.—These symptoms consist of emotional and intellectual deterioration, splitting of the personality, grotesque and changeable delusions, introversion, indifference, inaccessibility, lack of insight, disappearance of voluntary activity, stereotypy, negativism, and suggestibility.

60. **Types**.—The schizophrenic group has been subdivided into five smaller groups; heboidophrenia or the simple type, hebephrenia, catatonia, paranoid forms, and mixed forms. Each differs in the grouping, prominence, and course of the fundamental symptoms, but it should be borne in mind that transition from one form to another and intermingling of forms are very common. Clinical experience continually demonstrates the artificiality of these groupings and the impracticability, in numerous cases, of making sharply drawn differentiations.

a. *Heboidophrenia or the simple type*.—This is an impoverishment and devastation of the whole psychic life, developing insidiously as a deterioration, with few if any of the symptoms abundant in other forms. The boy or girl hitherto apparently normal, begins to show lack of interest, seclusiveness, listlessness, and failing ability to acquire knowledge. There may be fleeting hallucinations, transitory delusions, and slight peculiarities of conduct, such as scarcely noticeable mannerisms or suggestions of negativism. These are the cases so

mild as to be unrecognized, or in which the so-called recovery is an adjustment on a lower level with a residuum of peculiarities construed to be inherent character anomalies. Could the history of many a criminal, hobo, prostitute, crank, and eccentric be traced, *there would be disclosed an episode of schizophrenic coloring which separated a period of relative efficiency from a following period of relative inefficiency.* It would be seen there had been inability to adjust to the ordinary social requirements, that responsibilities had been evaded, and refuge found on a lower level. On the contrary, many heboidophrenics stop short of regression to so low a level, and adjust themselves after a fashion in some humbler calling, where with the simplest duties and slightest responsibilities they manage to earn a livelihood. *While in these cases recovery may be said to be final, it is nevertheless incomplete, and a blight rests thereafter upon the whole of the psychic life.* Numerous other cases, however, withdraw more and more from reality and finally regress to those lowest of all praecox levels, those graver forms requiring institutional care. In the heboidophrenic, there is neither clouding of consciousness nor disorientation. But the mental activity diminishes, there is emotional deterioration and general apathy, memory and attention defect, and decreased psychomotor activity with lack of insight dominating the clinical picture.

b. Hebephrenia.—The onset of this type is usually more abrupt. Hallucinations are numerous and fleeting, involving especially the auditory and visual fields. Consciousness may show little clouding, and orientation be only slightly disturbed. Delusions are fantastic and changeable, apt to be disagreeable, and from being depressive become expansive in character. In the train of thought, there is a looseness and desultoriness superficially resembling flight of ideas. In conduct and behavior, there is childish silliness and senseless laughter. Silly laughter, with complaint of feeling sad, is a very characteristic symptom. The voluntary activity is inconsistent and lacks independence; at one moment the patient is headstrong, at the next, tractable. The personal appearance is neglected and all sorts of foolish and outlandish deeds performed; or the time frittered away in listlessly lounging about without evidence of real interest in anything. There is some stereotypy of attitude, movement, and speech. The latter abounds in stilted phrases, stale witticisms, obsolete words, and neologisms. Letter writing is characterized by frequent repetitions, lack or superfluity of punctuation, and copious underlining.

Memory for recent events decreases as the power of attention diminishes; and for remote events also, in proportion, as the increasing mental deterioration more and more erases memory pictures.

Aprosexia is characteristic. This enfeeblement of the power of voluntary attention is an outstanding feature of schizophrenia.

c. *Catatonia*.—In this form, volitional disturbances predominate. The onset is usually subacute or chronic but it may be very sudden, the patient becoming either profoundly stuporous or greatly excited. The typical symptoms group themselves into two stages, catatonic stupor and catatonic excitement, which irregularly alternate.

(1) *Catatonic stupor*.—The principal symptoms are stupor, stereotypy, negativism, and suggestibility. Stupor, in the sense here implied, does not signify a profound disorder of consciousness. The patients seem to know what is going on about them (they may be observed furtively noting occurrences), and the immobility is merely a form of negativism. Voluntary activity decreases to the vanishing point and stupor is manifested by lying perfectly still without movement or reaction to stimuli, and remaining absolutely mute. In many cases, however, the patient can observe, remember, and carry out complicated trains of thought if provided with the necessary stimulus. Negativism is shown in its three forms; doing nothing, the opposite of what told to do, or as negativistic opposition to physiological promptings. Stereotypy occurs as attitudinizing, mannerisms, and verbigeration. Suggestibility shows as reaction in accordance with impressions or suggestions derived from others. There may be repetition of words or phrases used by others (echolalia); repetition of the actions of others (echopraxia); a condition permitting molding of the limbs in any position (*flexibilitas cerea*); or reaction devoid of all personal initiative (automatism).

Perhaps behavior so utterly foreign to the normal individual is atavistic; regression toward those distant race beginnings when reason but glimmered and blind instinct ruled.

(2) *Catatonic excitement*.—In this phase, increased psychomotor activity predominates. Marked cases are constantly talking, shouting, and throwing themselves about on the bed. The actions, however, tend toward absurdity and are without purposeful direction. Nor is the noisy, incoherent talk to be mistaken for flight of ideas; there is no suggestion of a goal or idea, and the element of distractibility does not enter because little or no attention is paid to what is being said or done by others. Impulsive acts are common. Without warning, patients commit some violence, as tearing clothing, breaking a window, or assaulting another patient. In catatonia there is some clouding of consciousness and disturbance of orientation in phases of marked stupor or marked excitement. The delusions are fantastic and changeable. Thought is loose and desultory and reasoning diffi-

cult. Memory for the remote past remains surprisingly good. In emotional attitude these patients are at first sad, dejected, and complaining; later they become indifferent and contented; still later cheerful and even ecstatic. Catatonic excitement bears a superficial resemblance to the manic phase of manic-depressive psychosis. The two conditions, however, differ in important particulars. The answers of catatonic patients are absolutely irrelevant, but insistence will usually cause the manic to give momentary heed and a rational reply. The increased psychomotor activity of catatonia is more apt to be static; that is, he remains in the same place and the motor activity involves chiefly small joint movements; in the manic the activity is more apt to be dynamic, that is, large joint movements also come into play and he moves from place to place. Again, the movements of the catatonic are sudden, impulsive, violent, and restless, and the destructiveness seems merely a desire to be objectionable; it is a form of negativism. The motor excitement of the manic is less apt to show these interruptions; it is continuous, and the destructiveness instead of seeming intentional, merely expresses complete loss of control. Physical symptoms are more pronounced in catatonia than in any other form. There may be hippus, mydriasis, the phenomenon of Pilz, and differences in size of pupils. Tendon reflexes are usually exaggerated, cutaneous sensibility lowered, and vasomotor disturbances common. Loss of weight is common in the active stages.

d. Paranoid forms.—In both the hebephrenic and catatonic forms, delusions are characteristic but grotesque and changeable, of no particular type, and tend to ultimately fade. They are not persistent. On the other hand, the paranoid forms are characterized by the rapid development of fantastic and changeable delusions of the persecutory and expansive type, but not harmonized with events nor coherently developed. They are, however, persistent. Associated with this is a total lack of insight; that is, no appreciation of the abnormality of the condition nor attempt at explanation. The emotional attitude is changeable in harmony with the delusional content. Usually, also, there are hallucinations, chiefly auditory in character, although they may involve any sensory field.

e. Mixed forms.—The several forms described are not always clean cut. Mixed forms are very common. The hebephrenic, hebephrenic, and paranoid forms often present symptoms that are more characteristically developed in the catatonic forms.

f. Unrecorded and unclassified cases.—Without doubt numerous cases of schizophrenia are never recorded. Either they are undiagnosed, or are mild in type and make an adjustment on a lower level,

earning a livelihood in some humble calling under supervision; or they regress to the still lower level of the hobo, prostitute, or petty criminal. Many a dull, listless, odd, or wayward boy or girl with a poor school and vocational record is an undiagnosed schizophrenia. Numerous bright and highly regarded students who suddenly lapse in their work, become mediocre and unaccountably change, never again displaying the former intelligence and interest, and remaining content with a performance utterly belying the earlier promise. It is also a matter of ordinary clinical experience to meet with cases seemingly able to earn a living after a fashion but none the less bearing indelibly the stamp of the disease, although without an aggregate of manifestations permitting definite classification in any one of the different forms.

61. Course and prognosis.—*a.* Schizophrenia is no longer considered to result in a permanent disorganization of the personality. This was formerly considered to be the rule, and also as part of the requirements of the definition of schizophrenia, and a favorable outcome merely showed that a mistake had been made in diagnosis. Recovery does not always indicate that the personality will assume its prepsychotic integrity and level. The episodes may be remissions. No doubt the psychosis leaves its marks on personality, a trauma to the conscious which will leave its scar as will traumata to organic structure, but a social recovery is frequent with the individual doubtless less poorly endowed. Prognosis falls into three groups: first, those in which complete recovery is made; second and more frequently, those in whom periods of adjustment occur at a lower level for a considerable period of time; and the third group, which is the largest group, in which are found those who suffer permanent disorganization of the personality resulting in mental deterioration.

b. It is difficult to prognosticate what the final outcome will be in any given case of schizophrenia. However, there are certain facts which may act as guides in the formation of an opinion. It has been found that the more introverted the prepsychotic history the worse the prognosis. If we find the psychosis to be a gradual revolution of the previous personality, the prognosis is unfavorable. The more rapid the onset and the more acute the symptoms, the more probable is the occurrence of intermissions and remissions, although deterioration does occur following an acute attack. If the psychosis has been precipitated by environmental factors which can be remedied, the outcome is favorable. If there is found a marked affective element the outcome is favorable. If hallucinations persist, the outcome is unfavorable. If the psychosis has persisted more than

a year, the outcome is again unfavorable. Previous remissions indicate that the episode will be followed by improvement.

c. As to prognosis in the different types, the prognosis in catatonia is relatively good; perhaps 25 percent are restored to their prepsychotic level for varying periods of time. The prognosis of the simple form is bad, though these do not necessarily require institutional care. They are found touring the country as petty criminals and hobos. The hebephrenic type usually continues on to a final disorganization of the personality, although in some cases remissions do occur. Occasionally the paranoid type makes a social recovery, but complete recovery in this type is doubtful. But, as Bleuler states, "The treatment undoubtedly is the governing factor as to prognosis. The treatment will decide in more than one-third of schizophrenic cases whether they can become social men again or not."

62. Differential diagnosis.—a. The prodromal stage of heboidophrenia and hebephrenia must be differentiated from neurasthenia.

(1) *Heboidophrenia and hebephrenia*.—Sixty percent of cases occur before the twenty-fifth year. Grotesque and changeable delusions. Emotional apathy and indifference concerning symptoms. Lack of insight. Conduct disorders of a bizarre nature; mentally ill though not necessarily in a certifiable sense. Little or no improvement under appropriate treatment.

(2) *Neurasthenia*.—Most cases occur between the twenty-fifth and forty-fifth years, rarely before 20 or after 50. No delusions. Overemotional and intensely interested in symptoms. Introspective without insight. It is essentially a fatigue neurosis. Probability of improvement with appropriate treatment.

b. Paranoid forms from pure paranoia.

(1) *Paranoid forms*.—Rapid development of fantastic and changeable delusions of persecutory and expansive types, not harmonized with events nor woven into a coherent whole, but tending to persist. Lack of insight, inability to explain condition and conduct. Emotional attitude changeable and demeanor abnormal.

(2) *True paranoia*.—Insidious development of delusions of persecution largely based on morbid interpretations of actual events, woven into a coherent whole, and very persistent. Contradictions and improbabilities in the fabric of the delusional system apprehended and explained. Many exhibit such formally correct conduct and adequate emotional reactions as to more or less mask the true condition, so that when finally the delusional formation no longer gathers new material and loses much of the old, they are merely considered less odd and peculiar than formerly. Many others, how-

ever, become so abnormal in conduct and behavior as to be definitely asocial and to require institutional care.

c. Schizophrenia of middle life from paresis. Paresis may be established by examination of the blood and spinal fluid. In paresis, the mental deterioration is apt to be more rapid and profound. However, the diagnosis may be extremely difficult in those cases in which physical symptoms of paresis have not yet appeared.

d. Schizophrenia from manic-depressive psychosis. This is probably the most difficult differential diagnosis to make which is in part due to the fact that mixtures of the schizoid and cycloid types are found in individuals. However, the onset of schizophrenia is more insidious, the excitement more paroxysmal, the delusions more bizarre and the patient less distressed by them. Further, there is no harmony between the emotions, ideational content, and the behavior.

SECTION XIII

MANIC-DEPRESSIVE PSYCHOSIS

	Paragraph
History.....	63
Definition.....	64
Frequency.....	65
Time of life and sex.....	66
Etiology.....	67
General symptomatology.....	68
Onset, course, duration, and remissions.....	69
Prognosis.....	70
Pathology.....	71
Differential diagnosis.....	72
Summary and interpretation.....	73

63. History.—a. Mania and melancholia were described in the Hippocratic era; somewhat later by Celcus, Galen, Sydenham, and Morgagni; and more recently by Fleming, Ealret, Kahlbaum, Sankey, Schule, Ziehen, and various others, including Kraepelin. These industrious classifiers have described over 50 varieties of mania, and about 30 of melancholia.

b. Often there had been mentioned some relation between the disorders, but Kraepelin demonstrated, between 1896 and 1899, the very frequent occurrence of these contrasted disorders in the same individual, showed the conditions to be one and the same disease entity, and named the disorder “manic-depressive psychosis.” While it had been recognized that the manias and melancholias together with certain seemingly allied conditions appeared to represent diverging forms of disturbance, on the one hand emotional and in a sense recoverable, on the other, deteriorating and unrecoverable, Kraepelin

with one authoritative pronouncement cleared the situation by naming the former "manic-depressive psychosis" and the latter, "dementia praecox." When in 1899 Kraepelin placed the manias and melancholias of other writers in his manic-depressive group, he continued to regard involutional melancholia as a distinct disease entity and as set apart from other melancholias by the age incidence (presenile period), absence of previous attacks, anxious depressions, sense of impending danger, delusions of sinfulness, greater frequency of suicidal impulses, and the comparatively unfavorable prognosis. Besides these considerations, there was the uncertain factor of the influence of arteriosclerotic changes.

c. In 1907, Dreyfus, then an assistant of Kraepelin, published the results of an elaborate study of 79 cases previously diagnosed as involutional melancholia at the Heidelberg clinic. Because two-thirds of these made complete or nearly complete recoveries, only 8 percent showed mental deterioration and more than half had had previous attacks (usually depressions); he concluded all could be explained on the basis of manic-depressive psychosis, chiefly mixed type. In his introduction to this book, Kraepelin accepted these views and has maintained them in subsequent writings.

d. Many leading psychiatrists accept this conclusion but others dissent, so that opinion remains divided. The statistical committee of the American Psychiatric Association, while holding the matter under consideration, decided for the present to retain involutional melancholia in its classification as a separate entity and it will be so treated in this manual.

64. **Definition.**—Manic-depressive psychosis is a disorder, apparently not ending in mental deterioration but characterized by the recurrence of groups of reactions, essentially emotional, throughout the life of the individual. Mental deterioration may occur in atypical forms in which the attacks are so close together as to practically exclude normal life. The manic phase illustrates the extroversion type of reaction.

65. **Frequency.**—The psychosis furnishes about 15 percent of all admissions to mental hospitals. Of 70,987 first admissions to 48 hospitals in 16 states, there were 12,152 manic-depressives or a trifle over 15 percent. About 8,000 new cases are admitted to public mental hospitals yearly. The type incidence was as follows:

Type:	Number	Percentage
Manic	5, 480	45. 09
Depressive.....	4, 676	38. 47
Mixed	1, 312	10. 79
Circular.....	348	2. 87

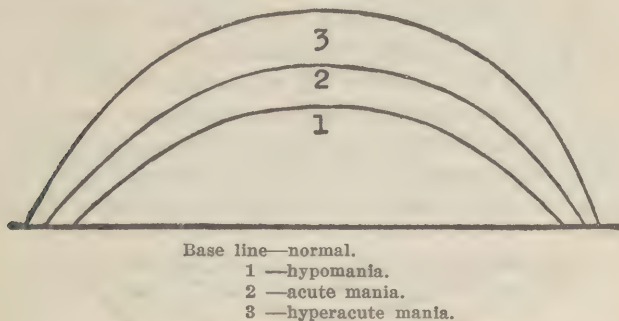
66. Time of life and sex.—Sixty percent of the cases develop before the twenty-fifth year and less than 10 percent after the fortieth; but the first attack may occur as early as the tenth or as late as the seventieth year. With such late occurrence, there must always arise the question of unrecorded previous attacks. Two-thirds of the cases occur in women, and in many instances the first attack coincides with the first menstruation or with the first childbearing, recurrence being associated with subsequent childbearing periods. It is a fact, however, that in many of these instances recurrences do not cease with the climacterium.

67. Etiology.—The cause of the manic-depressive psychosis is at present unknown. Psychobiological and psychogenic factors and forces are involved. Many theories have been suggested which involve metabolic, endocrine, and other physiological disturbances. Also no histological, biochemical, or biophysical disturbances have ever been demonstrated in the brain. There is a personality make-up of irritability and instability with proneness to excitements and depressions without adequate cause. On such a predisposing background, any exciting factor, one perhaps not unduly disturbing to the normal individual, is sufficient to produce psychotic disturbance. A familiar psychoneurotic or psychopathic taint has been shown to exist in from 75 to 90 percent of cases.

68. General symptomatology.—Manic-depressive psychosis is essentially an affective disorder. It is strikingly characterized by emotional oscillations with subsidences and recurrences. The symptoms broadly express qualitative disturbances of the normal mental processes and their effects either in increased psychogenic activity (mania), decreased psychogenic activity (depression), or fusion of the components of mania and depression in the same patient (mixed type). In the manic phase there is exaltation of emotional tone with rapidity of thought and action; in the depressive stage, depression of emotional tone with retardation of thought and action; and in the mixed types, fusion of these fluid components; in each instance in varying degree with respect to an hypothetical emotional normal. The attempted adjustments of the manic-depressive, therefore, differ in degree only from those of normal individuals. The disorder manifests itself in three principal phases; manic, depressive, and mixed. In addition, there occur other manifestations such as recurrent manic, recurrent depressive, alternating manic and depressive, alternating double phase, circular, and various other forms.

a. Manic phase.—This phase exhibits three degrees of fluctuation above the hypothetical normal reaction tone level, that is, three degrees of mania; hypomania, acute mania, and hyperacute mania, each

presenting in proportional or disproportional degrees of severity, three cardinal symptoms; flight of ideas, emotional excitement, and increased psychomotor activity. These three degrees of manic may be diagrammatically illustrated as follows:



As the mania mounts, the three cardinal symptoms augment in severity, but not necessarily in proportionate degree.

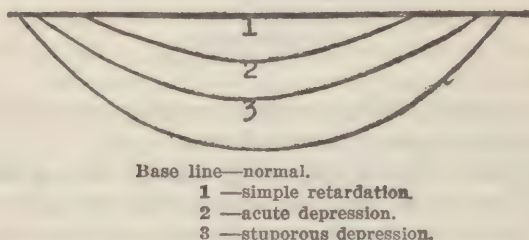
(1) *Hypomania*.—This is the mildest of the three grades of manic excitement. There is no clouding of consciousness nor is the patient disorientated but there is clear manifestation of the three cardinal symptoms; flight of ideas, emotional excitement, and increased psychomotor activity. The typical patient rises early, bustles noisily about from one matter to another, showing great good humor or flying into a rage if thwarted, exhibiting throughout the unproductive day a maximum of effort and minimum of accomplishment. These patients characteristically show increased busyness, but decreased capacity for accomplishing worth-while things. They do unnecessary and foolish things.

(2) *Acute mania*.—This is the second grade of manic excitement. There may be some clouding of consciousness and some disorientation, with fleeting hallucinations and changeable delusions of a grandiose nature. Flight of ideas with distractibility is so marked that the train of thought may become incoherent and dwindle to strings of words, merely similar in sound (clang-association). Emotional excitement and exaltation is shown by boisterous laughter and exaggerated ideas of self-esteem and personal prowess. The increased psychomotor activity is constant. The patient seems absolutely unable to keep quiet (pressure of activity); he runs, jumps, somersaults, tears his clothing, breaks furniture, howls and yells the night long, does not even take time to eat, and frequently shows extreme sexual excitement.

(3) *Hyperacute mania*.—This is the severest grade of manic excitement and is merely an aggravated form of acute mania (a deliri-

ous mania). Consciousness is more clouded, disorientation more complete, flight of ideas so great as to reach incoherence, emotional excitement intense, and psychomotor activity unremitting, a condition inevitably leading to great exhaustion and physical depletion.

b. Depressive phase.—This phase exhibits three degrees of fluctuation below the hypothetical normal reaction tone level, that is, three degrees of depressions; simple retardation, acute depression, and stuporous depression, each presenting in proportionate or disproportionate degrees of severity three cardinal symptoms, each the opposite of the corresponding cardinal symptom of the manic phase; retardation, emotional depression, and decreased psychomotor activity. These three degrees of depression may be diagrammatically illustrated as follows:



As the depression deepens, the three cardinal symptoms deepen in severity but not necessarily in proportionate degree.

(1) *Simple retardation.*—This is the mildest grade of depression. Consciousness is not clouded nor orientation disturbed. Retardation, or difficulty in thinking, is expressed by the patient answering in monosyllables, slowly and in a low tone, or just above a whisper. Emotionally he is depressed, but not to a marked degree, the facial expression perhaps not even indicating it. Decreased psychomotor activity is shown by moving slowly, speaking slowly, abandonment of voluntary effort, and sitting about with folded hands, doing nothing.

(2) *Acute depression.*—This is the second and severer grade of depression, with the three cardinal symptoms more pronounced but with consciousness usually clear and the patient fully oriented. Hallucinations of the organic sensations and self-accusatory delusions with hypochondriacal ideas are the rule. Delusions are less frequent in acute and hyperacute mania because the racing thought moves too rapidly for their formation. Emotional depression is profound and indicated by an attitude of extreme dejection; the position is one of flexion with hands limp in lap, chin on breast, and shoulders bent forward, suggesting regression to situation, simulating that in utero. Retardation, including both difficulty in thinking and decreased

psychomotor activity, is shown by the almost inaudible, slow, monosyllable speech and very slow deliberate movements.

(3) *Stuporous depression*.—This is the third and most severe grade of depression. Consciousness is considerably clouded and orientation much disturbed. Dreadful hallucinations and delusions harass the patient, and all the symptoms of the phase of acute depression obtain in aggravated form. The patient does not even speak, but lies in bed absolutely inert, requiring to be fed and administered to in every way.

c. Mixed types.—(1) Mixed and atypical forms are of special importance because they occupy a middle ground between the classical manic-depressive types and the schizophrenic. In the mixed types, the three cardinal symptoms of the manic and depressive phases are so intermingled that the resulting state is neither the one nor the other, but a mixture of the two. The following mixed types are recognized:

(a) *Manic stupor*.—Emotional exaltation, decreased psychomotor activity, difficulty of thinking.

(b) *Agitated depression*.—Emotional depression, increased psychomotor activity, flight of ideas.

(c) *Unproductive mania*.—Emotional exaltation, increased psychomotor activity, difficulty of thinking.

(d) *Depressive mania*.—Emotional depression, difficulty of thinking, increased psychomotor activity.

(e) *Depression with flight of ideas*.—Emotional depression, flight of ideas, decreased psychomotor activity.

(f) *Akinetic mania*.—Emotional exaltation, flight of ideas, decreased psychomotor activity.

(2) So protean, however, are the manifestations that the above classifications by no means exhaust the possibilities. Additional combinations occur. Some of the combinations of the manic and depressive phases and quiescent periods are as follows:

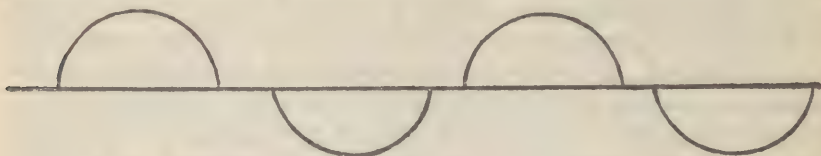
(a) *Recurrent mania*.—Here there are recurrent attacks of manic phases separated by quiescent periods.



(b) *Recurrent depression*.—Here there are recurrent attacks of depressive phases separated by quiescent periods.



(c) *Alternating forms*.—Here there are manic and depressive phases, each followed by a quiescent period.



(d) *Alternating double phase*.—Here there are cycles of mania and depression, each followed by a quiescent period.



(3) Still other types have been described, inasmuch as the manic and depressive phases may be variously combined.

69. *Onset, course, duration, and remissions*.—*a*. There may be a prodromal period extending over days, weeks, months, or even years; or the condition may develop very suddenly. In the latter instance, however, there may have been prodromal indications which escaped observation. Statistics show that the first attack is apt to be a depressive phase.

b. The course presents manifold variations; in many cases the lack of uniformity is so marked and the diversity of manifestations so great, that doubt arises as to the form occurring.

c. The duration also is subject to wide fluctuations. It may last only a few days, weeks, months, or years, even 10, 20, or more. A single phase has lasted 20 years.

d. Remissions may be of any duration, ranging from hours or days to many years. There is a record of a remission lasting 44 years. Or there may be but one attack in a lifetime. However, in such an instance, there may have been unrecorded mild attacks.

70. *Prognosis*.—Recovery from single attacks is the rule, but recurrence is quite certain. Prognosis is therefore good concerning separate attacks, but unfavorable as to ultimate recovery. Recovery is only so-called, merely an adjustment on the background which perhaps is in reality the disorder itself. Noyes presents some interesting figures as to course and prognosis. In the 8,000 manic-depressive cases admitted or readmitted to New York State hospitals, there were no readmissions in more than half of that number. The most frequent age for the first manic episode was between the ages of 15 and 25. The average age for the first depressive episode was

found to be about 10 years later, or 25 to 35. If either episode was found to occur in early life, the prognosis was bad. As age increased, the tendency was more to depressive episodes. The average duration of the manic episode was 6 months, and of the depressive 9 months, also as age increased, the psychotic periods tended to become longer and the normal intervals shorter.

71. Pathology.—There is no demonstrable pathological anatomy.

72. Differential diagnosis.—The mixed and atypical forms occupy a middle ground between the classical manic-depressive types and schizophrenic reactions, so the diagnosis may be extremely difficult.

a. The manic phase is differentiated from catatonic excitement as follows: The answers of catatonic patients are absolutely irrelevant, but insistence will usually cause the manic to give momentary heed and a rational reply. The increased psychomotor activity of the catatonic is more apt to be static, that is, he remains in the same place and the motor activity involves chiefly small joint movements; in the manic, the activity is more apt to be dynamic, that is, large joint movements also come into play and he moves from place to place. The movements of the catatonic are sudden, impulsive, violent, restless, and the destructiveness seems merely a desire to be objectionable; it is a form of negativism. The motor excitement of the manic is less apt to show these interruptions; it is continuous and the destructiveness, instead of appearing intentional, merely suggests complete loss of control.

b. The depressive phase of manic-depressive psychosis presents fluctuating cardinal symptoms and absence of mental deterioration, with usually a history of previous attacks; the stuporous stage of catatonia the so-called stupor, with stereotypy, negativism, suggestibility, and mental deterioration.

73. Summary and interpretation.—Manic-depressive psychosis is extroversion reaction. The patient endeavors to solve his conflict by a flight into reality, by extroversion. This flight is the manic phase, during which he seems to be at the mercy of his environment, attention being diverted by every passing stimulus. The stream of diverting activities is a defense mechanism and the effort to cover every possible approach to the complex by rushing wildly from every danger of disclosure. In the depressive phase, the defense mechanism breaks down and the patient is overwhelmed by his conflict. The flight of the manic phase is a lesser failure than the submission of the depressive, but is still a failure. The psychosis reveals not as much the nature of the conflict as the manner of dealing with it. The

benign character of the manic-depressive group is explained on the ground of their extroverted mechanism. Reality is the normal direction for the libido, and because the direction is normal, they more readily tend toward recovery. Viewing the disorder as issuing from a background of predisposing psychopathic inability to cope with reality, certain of the phases may be interpreted somewhat as follows: The manic, as an attempt to conceal the complex by a diverting stream of activity; the depressive, as open confession of failure by abandonment of effort; the intermingling of symptoms in the mixed, as an increased futility of effort; the alternating and circulating as oscillations between flight and defeat; the atypical, as psychic rout; and the remissions, adjustments at best precarious because of the continuing psychopathic predisposition. The admitted background may be considered as the disorder itself, and the manifestation as grades of disturbance ranging from mild exaggeration of the individual normal reaction type to the asocial extreme.

SECTION XIV

INVOLUTIONAL MELANCHOLIA

	Paragraph
General.....	74
Symptomatology.....	75
Prognosis.....	76
Differential Diagnosis.....	77
Treatment.....	78

74. General.—*a.* Much controversy exists concerning whether or not involutional melancholia should be considered a clinical entity. Kraepelin first introduced involutional melancholia as an entity distinguishable from the depressive phase of manic-depressive psychosis. It seems that Kraepelin has changed his opinion and now agrees that involutional melancholia is to be regarded as manic-depressive psychosis of late occurrence. However, it is believed with Noyes that there are special physiological and psychological factors of such dynamic importance and so peculiar to that period of the individual's life during which this mental disturbance occurs that separate consideration is justified.

b. As the name implies, this disease occurs during the involutional period of life and as such is found most frequently in women during the late forties and in men during the late fifties. The Chinese have a proverb in which they state that the productive period as to age is seven times seven in women and eight times eight in men. During this period, the endocrine and reproductive glands are suffering a

decrease in functional activity with concomitant changes in the chemical, metabolic, and vegetative activities of the body.

c. It is difficult to determine how much etiological value to place on these physiological changes, but as the soma and psyche are considered as one, the conclusion is that they are important. The pre-psychotic history is again of importance, as in a large number of cases there seems to be found a certain general type of personality make-up. It will be found that this type of personality is the inhibited type of individual, the overconscientious with a lack of humor, the plodder, the ideal servant, the morbidly disposed. Women seem more inclined to the disease than men. Life has not brought to these individuals the success and happiness that they have consciously or unconsciously striven for, and now at the turning point of life they realize that it is too late to achieve new successes or ambitions and the transition to another stage of life is not easily made.

d. The ebbing potency in the male, as Noyes states it, and the realization on the part of the female that she cannot now bear children, which she probably has intentionally kept from doing in her early life, is to the patient more than the loss of these functions; it is a symbol, a sense of failure that both the sources and ends of energy have failed. Humans lay special stress on the reproductive organs as being the source and criterion of manly and womanly strength, and physiologically such is the case. To the extent this instinctive urge or striving influences the individual, on the proper background, determines the reaction at the menopausal age. As physical strength decreases, old conflicts and complexes become stronger. Retiring from business or from the military service, or breaking up home ties are means of precipitating this psychosis. It may be regarded as the morbid expression of the feeling of growing inadequacy, and those who are morbidly disposed by nature become melancholic most easily, and women seem more inclined to the disease than men.

75. Symptomatology.—The characteristic feature of this disease is an apprehensive depression with delusions of sinfulness (an unpardonable sin), often merging into a definite anxiety state (anxiety neuroses are common at this period). The manifestations range from a profound depression through an agitated melancholia to a confused state, according as there is an intense apprehensive depression, a similar condition with agitation, or an exaggeration of these symptoms reaching confusion with clouding of consciousness, hallucinations, and disorientation. In addition to delusions of sinfulness, there may be those of an hypochondriacal nature; of persecution; of poverty, of possession; or of grandeur. It should always be remem-

bered that the danger from suicide is greater in this psychosis than in any other. Every case of melancholia is a potential suicide.

76. Prognosis.—Forty percent of patients recover from this disease, although they are frequently ill for 2 or 3 years. The prognosis naturally depends on the extent of the melancholia and the extent of deterioration of personal habits.

77. Differential diagnosis.—In differential diagnosis, manic-depressive psychosis, cerebral arteriosclerosis, and the anxiety states seen in the psychoneuroses must be considered. The age factor should first be given consideration between manic-depressive psychosis and involutional melancholia, as the latter need not be considered unless the age factor is favorable. Also in manic-depressive psychosis, there is usually a history of previous attacks and there is not the fear and apprehensive depression noted in melancholia. In differentiating cerebral arteriosclerosis, there is usually a memory loss in this disease, and a lessening of initiative.

Fear is not present in the psychoneuroses as in melancholia. They have no delusions or hallucinations and their interest in the outside world is maintained, while in melancholia the relations with reality is disturbed.

78. Treatment.—Treatment first involves the taking of every precaution to prevent suicide. The general physical upbuilding is important together with intelligent nursing and occasionally a drug to relieve agitation.

SECTION XV

PARANOIA

	Paragraph
General.....	79
Types.....	80
Stages.....	81
Diagnosis.....	82
Differential diagnosis.....	83
Prognosis.....	84
Treatment.....	85

79. General.—*a.* Paranoia of itself is not important from a statistical standpoint, for true Kraepelinian paranoia, as Noyes states, is much less frequent than are paranoid reactions which are frequently seen in all sorts of conditions. There is extreme paranoia on the one hand and paranoid schizophrenia on the other, with many variations, which is to be expected since personalities cannot be classified in distinct categories any more than the mental mechanisms with which each individual meets his life experiences can be classified.

b. Kraepelin in his original theses on paranoia, looked upon paranoia as a fixed type of disease due exclusively to internal causes and characterized by persistent, systematized delusions, the perseveration of clear orderly thinking and acting, and by the absence of hallucinations. He also recognized a disease entity which he termed "paraphrenia," classified between the true paranoia and paranoid schizophrenia, and which had as its characteristic features the presence of hallucinations, the delusional system more marked than in true paranoia, and mental deterioration.

c. Noyes gives the following definition for paranoia and the paranoid conditions: "A type of personality reaction characterized by the mechanisms of projection or of compensation or by both acting simultaneously, not precipitated by toxic or organic states, and not accompanied by dilapidation of affect, of conations, or of associative processes."

d. The processes involved in this condition are again only exaggerations of those found in the apparently normal. All persons have weaknesses which they tend to rationalize in some way or other. True paranoia is so rare that Dr. White, in St. Elizabeths Hospital, on one occasion stated that out of the 4,000 or more patients who were at that time in that institution he could not present what he called a good case of paranoia. Paranoiacs are usually too smart to stay in institutions. With their energy and apparent intelligence, it is difficult to convince a jury or court that they are psychotic. The old school of psychiatrists said that it took a man of brains to be a paranoiac.

80. Types.—Three types of paranoia may be considered; true paranoia, paraphrenia, and paranoid type of schizophrenia.

In this paranoid group is found, as a prepsychotic history, individuals who have an exaggerated tendency to place responsibility for their failures on others, those who repudiate the aspects of their personalities that do not measure up to the goal which they have set for themselves, thereby gaining a sense of security which does not exist. The mental mechanism involved is that of projection. The paranoiac uses this mechanism to protect that part of his personality which he recognizes as weak, to gain recognition greater than he is able to acquire, and to meet his conflicts whether they be from within or from without. In true paranoia, there is no deterioration. By deterioration in these conditions is not meant actual destruction of brain substance. This brings to attention the term "deterioration." Deterioration is here considered to designate gradual inability of the individual to cope with his environment at the social level, that is, to adjust himself to the common herd. In discussing the symptoms

of paranoia, the prepsychotic manifestations which are found in the individual's history are of interest. The patient as a child was a stubborn, suspicious, sullen youngster who was resentful of parental and school discipline, given to sulking and unable to get along with his playmates. As he passed through adolescence into adult life, these characteristics continued with rigidity of opinion becoming more marked and an apparent self-confidence. This show of self-confidence being nothing more, however, than an assumed characteristic used to cover his sensitiveness and self-consciousness. As these characteristics develop, there is a tendency to morose abstraction in which the individual endeavors to analyze his failures and in his attempt to fix a blame for his failures, he develops his delusions, and ideas of reference. He develops a feeling of resentment toward others. He rationalizes with great affective energy which is one of the characteristics of paranoid reactions. This stage may be termed the "stage of persecution." From this stage there may be a transformation of personality into a stage of grandiosity. The patient assumes the role to which his grandiose ideas have placed him. This external behavior may be as variant as the different ideas developed by the patient.

81. Stages.—The symptoms of paranoia are classified into the stages of self-analysis, persecution, and grandiosity.

a. During the stage of persecution, common findings in paranoid conditions are illustrated by the individual believing that someone is tampering with his mail; large organizations, usually fraternal, are conspiring against him; agents, such as secret service, are prying into his business affairs; in fact, he notes connivances against him on every hand and in various disguises. This delusional theme is characteristically illogical. Any event, however irrelevant, is connected to his delusional theme and supports his dominant idea, which carries with it marked effect. Not content with present events, he revives incidents of the past to support his delusional theme. He gives them a new interpretation. This process is termed "retrospective falsification." As his delusional theme or system continues to expand, almost any incident however trivial has an overvalued significance, and no amount of argument can change his attitude, as is typical of paranoid patients, he knows that he is right because his inner sense of security, as Noyes terms it, does not permit him to do otherwise.

b. The grandiose type of paranoia may appear at the beginning of the psychosis or may be a long time in establishing itself after the period or stage of persecution. A typical and frequent form of this grandiose period is that of ideas of invention. The patient works

continually on some invention which is usually in itself an impossibility, such as machines of perpetual motion. Also characteristic of this type of patient is that he is so engrossed with his invention or dominant idea, that he does not consider his livelihood. When he does construct his models or invention, foreign and secret agents steal them or are hindering in securing their patents.

c. Quite common is the religious paranoiac. Those who have visited wards in mental hospitals have noted patients who were Christs and chosen ones of God. They usually have supernatural powers. Some are so successful as to establish new religious sects; while others are so bizarre in their beliefs and behaviors that they cannot convince even notoriety and sensation-seeking moronic individuals.

d. Then again is found the erotic form. Examples of this type of paranoia are frequently seen in the daily newspapers. Movie stars are being annoyed by love epistles; heiresses are pestered with so-called "cranks" who are in love with them, and if they are not successful in their attempts at love-making, the recipient is merely testing the individual's love. Movie fan mail is evidence of paranoid erotic tendencies of the writers who really wish to be these so-called "stars" but can only attain satisfaction to the extent of the letters. This is an illustration of projection.

e. Freud's theory as to the origin of paranoia is that there is incomplete evolution of the personality, a fixation at the homosexual level; that these individuals consciously will not admit, as Noyes states, "I love him." They change it to "I do not love him; I hate him." This is not acceptable to the personality so the mechanism of projection is brought into play and the reaction is that "He hates me," which is further elaborated into "I am persecuted by him," and the result is a paranoid reaction.

f. The true paranoiac is usually a person of superior intelligence and may be explained by the method in which he deals with his reactions. He uses rationalization, and to be able to explain his, at times, very complicated dominant idea or delusional theme, requires an almost uncanny intelligence. This is in itself one of the distinguishing characteristics in differentiating true paranoia from the paranoid schizophrenic. The schizophrenic gives up his struggle for self-esteem, resumes a passive attitude, and has a tendency to regress rather than to rationalize.

g. Attempts have been made to classify paranoia as to different forms, especially as related to the delusional systems involved, therefore in some textbooks are described litigious paranoia, religious paranoia, political paranoia, and erotic paranoia. While these forms of paranoia are the most usual, the descriptions are not so im-

portant as determining the causes of distress of the patient and ascertaining the mechanisms he is using to effect a compromise with these causes.

h. In a typical case history is found the inability of the patient to secure for himself a satisfactory adjustment to his repressed feelings of inadequacy and to his other complexes as well as his homosexuality. In many paranoiacs, evidences of sexual inadequacy is found in some form or other, either physical or psychical. Impotence is frequently met with and as a compensatory reaction, the individual usually accuses his wife of dissatisfaction on her part and that she is obtaining sexual pleasures from other men, therefore he is released from his humiliating feeling of inferiority. From the physical standpoint, genital maldevelopments are quite frequently noted in paranoiacs.

82. Diagnosis.—The essential features of this condition may be summarized as follows:

a. There is a dominant or fixed idea, delusional in nature, constituting the basis of the psychosis.

b. There is progressive development of a plausible and logically coherent system of false interpretations, delusions, and retrospective falsifications around this fundamental fixed idea.

c. Hallucinations are either absent or rare.

d. The patient's emotional tone and reactions are in harmony with his delusional system.

e. The course of the disease is chronic but not deteriorating.

83. Differential diagnosis.—Stress must be given to differentiation between paranoia and the paranoid form of schizophrenia. The outstanding differential characteristic is the extent to which the patient's contact with reality has been disturbed. The more this is disturbed, the more it approaches paranoid schizophrenia. Other points of differentiation are that in schizophrenia is found an inability to explain conduct and the emotional attitude is inadequate.

84. Prognosis.—It is doubtful whether any true paranoiac ever recovers. A larger percentage of paranoiacs die from degenerative circulatory diseases than in any other group of psychoses. This may, as Noyes states, show a somatic association in that the cardio-vascular system cannot compensate for the demands made upon it, or an evidence of dynamic unity of the organism.

85. Treatment.—Treatment depends on the individual patient. When the behavior becomes sufficiently disorganized, commitment is necessary. All interferences and restraints usually extend his delusional system. It is far better, unless the patient is dangerous, to allow him to remain in his environment.

SECTION XVI

GENERAL PARALYSIS OF THE INSANE

	Paragraph
History.....	86
Definition.....	87
Frequency.....	88
Time of life.....	89
Etiology.....	90
Other causal factors.....	91
Pathological anatomy.....	92
Onset, course, duration, and remissions.....	93
Prognosis.....	94
Symptomatology.....	95
Tabetic forms.....	96
Summary of mental symptoms.....	97
Differential diagnosis.....	98
Treatment.....	99

86. History.—General paralysis is not described in the old medical literature; its exact description dates back only about 100 years. The first account of the physical and mental symptoms as constituting a single disease process was by Bayle in 1822. It was described by Calmeil in 1826 and again by Baillarger in 1846, who proposed the name "paralytic dementia." That it was due to syphilis was first advocated by Esmarch and Jessen in 1857. In 1858, the French Medico-Psychological Society agreed the disorder should be regarded as a distinct disease entity. In 1904, Alzheimer and Nissl demonstrated the histopathology of the disease, and in 1913, Moore and Noguchi demonstrated the treponema pallidum in parietic brains. Because the disorder seems to belong especially to modern life, Kraft-Ebing termed it a "disease of civilization and syphilization."

87. Definition.—General paralysis is a psychosomatic disorder produced by a progressive syphilitic meningo-encephalitis leading to a degeneration of the parenchyma with an infiltration of interstitial elements and manifesting itself in a comprehensive but variable syndrome of neurological and mental disturbances with fairly constant serological changes. (Noyes.)

88. Frequency.—This disease furnishes about 8 percent of all first admissions to asylums. About four to five times as many males as females are affected. Paresis appears to affect syphilitic brain workers and intelligent persons more frequently than manual laborers and the illiterate. It seems to be of varying frequency in different races and to be practically unknown among uncivilized peoples. Not over 5 percent of syphilitics develop paresis.

89. Time of life.—General paralysis is preeminently a disease of middle life, the majority of cases occurring between the thirty-fifth and forty-fifth years. It is rare before 25 or after 55, but may occur at any age. Late cases, those of about 60 and after, are often called senile paresis. Paresis appears in from 2 to 30 years after the luetic infection, usually within 10. Juvenile cases seldom develop before the tenth year, usually from the thirteenth to the eighteenth years, and appear to last slightly longer than adult forms, or about 4 to 7 years. Paresis appears to occur earlier in men than in women, perhaps because women are apt to contract syphilis later than men.

90. Etiology.—The cause of general paralysis is syphilis. The spirocheta pallida has been found in the cortex, spinal fluid, and cord. An attempt to produce syphilitic symptoms by inoculating paretics with chancre virus failed. A certain physician inoculated nine paretics who were in the last stages of the disease and in whom syphilis had not been demonstrated, but with negative result. It is of interest that no pathologist, physician, or attendant has ever contracted the disease from a patient. The occurrence of paresis seems entirely without relation to the severity of the original syphilitic infection. In many instances, the history shows the infection to have been accompanied by few and mild symptoms.

91. Other causal factors.—The question of causal factors other than syphilis arises in view of the fact that not over 5 percent of syphilitics develop paresis; that it is practically unknown among uncivilized peoples, notwithstanding they have much syphilis; and that it affects brain workers and intelligent persons more frequently than manual laborers and illiterates.

a. Why, in not more than 5 percent of syphilitics, do the spirochetes attack the parenchyma of the cortex? Are there strains of special virulence? Are there strains possessing localizing powers for certain situations, with special predilection for certain forms of nervous tissue? Are there different races of spirochetes, and if so, is there a spirochete specific for paresis? In other words, is paresis a separate venereal infection? (There is a record of five men contracting the disease from the same woman.) Further, are paretics who exhibit also the manifestations of ordinary syphilis (a rare combination), patients who contracted two separate specific diseases at the same time? Does the paretic, because there is a specific paretic infection, have the disease whether or not he ever had ordinary syphilis? Should the latter assumption be correct, it would raise the question whether the development of paresis is in reality delayed for so long as 10 years after infection. None of the above questions has as yet been answered.

b. Where the spirochetes are during the years elapsing between the initial infection and the development of the disease is as yet unanswered. They may have halted along the way or even have reached the cortex, in either case remaining inactive in intracellular granule form, due either to increased tissue resistance, diminished virulence, or the naturally unfavorable soil offered by the cortical tissues for development of the parasite. The ultimate incidence of the disease might be due to some condition or combination of conditions, such as debilitating illness, head trauma, meningitis, toxæmia, alcohol, mental or physical overwork, or worry, lowering resistance to a point permitting resumption of activity. How the spirochetes gain entrance to the parenchyma of the cortex has not been fully answered; certainly not from the meningeal coverings, since the limiting membrane of the outer zone of the cortex acts as an impenetrable barrier between the latter and the innermost layer of the pia. It has been shown, however, that the spirochetes may travel from an initial luetic lesion along the peripheral nerves. Spirochetes have been found in the lymph spaces of the perineurium and between the nerve fibres. It has been shown further that the perineural lymph sheaths of the spinal roots and nerves do act as afferent channels to the central nervous system. In view of the fact that some syphilitics have liver lesions, others bone lesions, others interstitial brain lesions, and others lesions of the cortical neuron elements, it might be worth bearing in mind that the distribution and destination of an organism, which is carried by the blood and lymph and which is itself actively motile, might vary somewhat in different cases according to the element of chance.

c. There is little evidence for assumption that there is a special predisposition or an inherent neuropathic defect which renders an individual more liable following luetic infection to develop paresis. On the contrary, psychopathic predisposition is almost certain to find expression in reckless exposure to syphilitic infection and thus multiply the probabilities for paresis.

92. Pathological anatomy.—Although only a person who has had syphilis can become a parietic, the disease nevertheless is not a form of tertiary syphilis, for the anatomic changes are not typical syphilitic tissue changes. Paresis is a mixed degenerative and inflammatory disease; the primary condition is a degeneration of the cortical neuron elements with inflammatory changes in neuroglia, meninges, and vessels as secondary occurrences, although the two sets of changes may proceed simultaneously. While other syphilitic brain diseases are also degenerative and inflammatory, the primary changes are interstitial with degenerative changes in the neuron elements secondary. No one finding is pathognomonic of this disease, although

a combination of certain changes is suggestive. The pathological anatomy will be considered under two heads; macroscopic and microscopic.

a. Macroscopic changes.—The dura is usually partially adherent to the calvarium; the pia is thickened, whitish, and translucent along the vessels except over the occipital lobes, and adherent, tearing on removal. The convolutions, especially of the frontal lobes, are atrophied, and the pia over these atrophied convolutions contains blebs filled with serum. The ventricles are dilated and the choroid plexuses contain cysts. The ependyma, especially of the fourth and lateral ventricles, presents granulations composed of increased glia cells, causing the usual glistening surface to have a frosted appearance. The weight of the brain is regularly below normal, and may be reduced to 900 grams.

b. Microscopic changes.—Cell changes of varying degree are found in the cortex but few are pathognomonic for paresis. These cell changes lead to destruction but there is least involvement of the occipital lobe, especially the calcarine area; and of the central convolutions, especially the precentral. In a given diseased area, normal cells are found lying side by side with diseased cells and these degenerative changes in cells and processes result in atrophy of the cortex, which in extreme cases, may shrink to one-half its normal width. A common finding in paresis are the rod-shaped cells of Nissl, the distortion or turning of cells in all directions (architectonic changes), and infiltration of the perilymph spaces with lymph, plasma, and mast cells. Vascular lesions in the cortex are prominent. The vessels are increased in number, their walls thickened, and some show small aneurisms. In addition to the finer microscopic changes in the cortex, there are small areas of softening but gross focal lesions are rarely seen. The basal ganglia, central gray matter, and cerebellum also present degenerative changes in the nerve cells and fibre tracts. In the spinal cord, there is degeneration of the tracts in the posterior and lateral columns. Vascular changes in the internal organs occur so frequently as to seem to bear a distinct relationship to the disease process, the most prominent being atheroma of the aorta and arteritis of the vessels of the liver and kidneys. Special points to be remembered are: almost no change in the dura, but important changes in the pia; very few changes in the occipital lobe, but many in the frontal; Nissl cells, distortion of cells, degeneration of cells, infiltration of perilymph spaces. A moderate internal hydrocephalus and dilated ventricles; vascular changes; atrophy of convolutions with reduction in brain weight.

93. Onset, course, duration, and remissions.—*a.* The onset is insidious, often quite neurasthenic in character. Like the neurasthenic, the paretic complains during the prodromal period of not feeling well. Later, when the disease is well established, he exhibits marked indifference concerning his condition, protests there is nothing the matter with him, and shows total lack of insight.

b. In a study of 74 male paretics at the New York Psychiatric Institute, reported in the American Journal Medical Science, March 1926, it was found that the earliest symptoms which may occur in patients who later develop outspoken general paralysis to be as follows:

(1) Irritability holds first rank since it occurred as the earliest abnormality in 42 cases, or 57 percent of the 74 cases.

(2) The character change whereby an individual is reduced in activity and spontaneity, loses some of his interests, tends to withdraw into himself, and is often described as having become "quiet", is likewise a common early symptom, occurring in 28 cases, or 38 percent.

(3) Loss of weight ranks third. It occurred, often very early, in 22 cases, or 30 percent of the series.

(4) An increased tendency to sleep, somewhat more suggestive in itself than any of the foregoing symptoms, was an early manifestation in 15 cases, or 20 percent.

(5) Speech defect, memory defect, and judgment defect have considerable diagnostic value in themselves; they were found in this series among the earliest symptoms in only 11 cases, 15 cases, and 7 cases, respectively.

(6) Visual impairment, digestive disturbance, insomnia, fatigability, headaches, tremor, and rheumatoid pains were present as the earliest manifestations in a few cases.

c. The course is frequently interrupted by spontaneous remissions lasting weeks, or from 5 to 6 years. During those interludes, there may be remarkable amelioration of symptoms chiefly on the mental side. It is difficult, therefore, to determine the permanence of the modern treatment of general paralysis. It would be preferable to designate these cases as being in full or complete remission. Following remissions, patients usually are worse and the course more rapid.

94. Prognosis.—The prognosis in untreated paresis is extremely unfavorable, most cases terminating in death within from 3 to 5 years.

95. Symptomatology.—The clinical picture is exceedingly varied because the physical and psychical disturbances not only occur in manifold combinations, but also differ greatly in degree in different subjects.

a. The disease is best studied in three periods; period of onset, fully developed period, and terminal period.

(1) *Period of onset.*—The period of onset is considered to date from that time when the clinician detects, either singly or in combinations, those physical and psychical disturbances which establish the diagnosis. It is preceded by a prodromal period, perhaps of months or years, during which there occur neurasthenoid-like changes in disposition, character, and judgment; a period during which the laity consider the patient only nervous and excitable; not physically or mentally ill, but merely less efficient. Because of the grave questions likely to arise concerning the degree of mental impairment and extent to which it affects responsibility for conduct and ability to transact business, this has often been called the medico-legal period. Similar questions may arise during periods of remission. The symptoms are physical and mental. There is no rule concerning the order in which symptoms appear. Physical and mental may appear simultaneously, either may predominate, or the two sets be variously combined. It is well to bear in mind that arrangement of the development into three periods is somewhat arbitrary, for the progression of symptoms from mild to severe and their intermingling and diversity as well, are subject to wide variations throughout the disease.

(a) *Physical symptoms.*—About this time, the appearance begins to undergo significant changes; the patient looks wearied, older, and loses weight; while the relaxing facial muscles and flattening nasolabial folds begin that wiping away of expression which eventually leaves only a vacant, wooden countenance, the paretic “ironed-out facies.” Among the most important physical symptoms are loss of the sympathetic light reflex; loss of the consensual light reflex; and slowing, weakening, or loss of the direct light reflex (Argyll-Robertson pupil) which occurs in about 50 percent of cases. The latter may occur in one or both eyes, and be in different degree. (Such anomalies are peculiar to paresis; not often seen in tabes.) In outline, the pupils may be irregular; and in size, one normal, the other miotic or mydriatic; both miotic or mydriatic; or one miotic and the other mydriatic. When miotic, the pupil may be so small as to form the paretic “pinhole pupil.” In certain individuals a light pupillary irregularity or inequality may be normal, and in some few paretics the pupils are without change throughout the disease. The most important tendon reflex is the knee jerk. It may be normal, exaggerated, diminished, or lost; on one, or both sides. The exaggerated is the most common. Unequal knee jerks are a frequent and important sign. Other helpful diagnostic signs on the physical side

may be defective innervation of one side of the face; transitory ocular palsies (more common in tabes); and tremors either fibrillary, fine, or coarse. The tremors are extremely significant. They appear in connection with voluntary movements as fibrillary of the tip and margins of the tongue when it is protruded; of the lips, angles of the mouth, and maso-libial folds in showing the teeth; and as flash-like twitchings flitting across the cheeks, orbital regions, and forehead in smiling. Frequently, however, the fibrillary tremors do not range so broadly, for the paretic tremor is apt to involve the lower face, and the alcoholic, the upper. Fine tremors may be seen in the fingers when the subject extends the hands and tries to separate the fingers. In the later stages, the defective innervation of all the muscles shows as a general trembling, or as coarse tremors particularly of the hands and tongue; in attempting to protrude the latter, to and fro movements occur. More gross motor disturbances show as adiadokokinesis, awkwardness and heaviness of gait, and clumsiness in doing ordinary things. Difficulties of articulation, while heard in this stage, are more pronounced in the fully developed period and are described in *b* below.

(*b*) *Mental symptoms.*—The neurasthenoid symptoms of the prodromal stage now become more pronounced. Complaint is made of insomnia or somnolence, great weariness, and frequently of a vise-like headache. The patient is apt to be depressed and free with complaints about his ill health and inability to accomplish things as formerly; in sharp contrast with the later tendency to be euphoric, he may overestimate his possessions and powers and engage in foolish and ruinous enterprises. The initial mental changes should be regarded as the beginning of a deterioration certain to progress rapidly toward a fatal dementia. Because the degenerative changes involve chiefly the frontal convolution, the first symptoms show as a deterioration of those functions which were the latest to be acquired. Consequently, accomplishments are not up to the former standard; the business man is less efficient, the artist does not paint as well, the musician's performance is less brilliant, etc. Interest in work diminishes, comprehension, reasoning, and judgment are impaired, and the ethical and esthetic sense dulled. There is a change in disposition, character, habit of thought and action, with alteration of the finer feelings and lowering of the whole moral tone. Delusions which later become so enormously expansive and grandiose, at this period are apt to be disturbing and depressive. Memory defects are prominent, but less for events than for resolutions, that is, the patient forgets what he has to do; post a letter, catch a train, lock the safe, etc. Accord-

ingly, as significant indications of mental deterioration, there appear little faults of memory, errors in speech and writing, growing indifference to higher sentiments, loss of critical faculty, small lapses in the proprieties, and failing interest in the more important affairs of life. As these mental features become more and more pronounced, the patient loses and mislays things; makes mistakes in money matters; errs in appointments; confuses persons and objects; forgets his way; is negligent in dress; shows extravagance in the use of money; evinces distinct loss of ethical feeling; and exhibits proclivities toward sexual and alcoholic excesses.

(2) *Fully developed period*.—Because of the tendency to become fat, proneness to fatuously protest he is quite well, and the frequency of fits, this has been named the “fat, fatuous, and fitty” period. In a typical case, all the symptoms previously mentioned, together with the additional ones enumerated below, will be clearly in evidence.

(a) *Physical symptoms*.—The chief physical symptoms are peculiar articulation and writing (the “paretic speech” and “paretic writing”); tremors; pupillary disorders; lost or exaggerated tendon reflexes; muscular weakness; apoplectiform or epileptiform seizures; emaciation; trophic disorders; and disturbances of the special senses.

1. Paretic speech is slow, hesitating, drawling, or scanning and the tone hard and monotonous. Labials and certain consonants are most difficult to enunciate, and the typical speech is shown in prolonged reading or in attempting to pronounce such words as “electricity”, “artillery”, “brigade”, “Methodist Episcopal”, “truly rural”, etc., in which the consonants may be left out, drawled over, or misplaced thus: “electericity”, “artillililery”, “brigrade”, “Methist Pispal”, etc. Or test sentences like the following may be used: “Around the rugged rock the ragged rascal ran his truly rural race”; “She stood at the door of Burgess’s fish-sauce shop”; “She sells sea shells and shav-ing soap”. Sentences such as these are also memory tests. The paretic handwriting becomes puerile and shows letters and words elided and reduplicated, large and separated letters, (a half dozen words may cover a page), undulating and widely spaced lines, tremors on the up strokes, and blots and smudges; these manifestations to be interpreted as associations of like phenomena on the intellectual side, that is, lapses of words, etc.

2. In this stage, the tremors previously mentioned, especially those of the fingers, tongue, and lips are much more in evidence.

3. In order of importance, the pupillary abnormalities are the Argyll-Robertson pupil; extreme miosis; variable inequality; and irregularity of outline.
4. The tabetic forms show diminished or lost knee jerks, while in other forms they are strikingly exaggerated or markedly unequal.
5. A progressive weakening of the muscles of the whole body, with occasional atrophy, is one of the most important physical symptoms of paresis. It is rather an enfeeblement than a paralysis. The weakening especially involves the lower limbs and the gait becomes shuffling like that of an old man, then tottering and falling, so that finally the patient takes to his bed.
6. The apoplectiform seizures resemble true apoplexy but the resulting paralysis is apt to be less permanent; in fact, it may disappear in a few days. Epileptiform seizures are apt to last longer than true epileptic attacks and consciousness may be retained. Sometimes there is status epilepticus. Local or Jacksonian convulsions also occur, said to be most frequent in thumb and index finger of right hand, apposition of these being the most recently evolved, most voluntary, and least stable motor function of the cortex. The seizures are believed to be due to accumulation of toxic materials to a point exceeding eliminative capacity. They occur in about one-half the cases and usually in the fully developed period, but may occur in the initial or terminal stage. The patient is usually worse afterward.
7. Rapid emaciation is the rule after the disorder is well established, and is followed in this period by gain in weight.
8. Among trophic disorders are bedsores, a striking fragility of the bones, hematoma of the cartilage of the ear supposedly due to trauma, and graying of the hair.
9. The chief special sense disturbances are deafness and visual defects, the former of central origin, and the latter due to optic atrophy.

(b) *Mental symptoms.*—The chief mental symptoms are hallucination (auditory); disorientation; delusions (marked by enormous exaggeration whether exalted or depressed); irritability or changeability; depressed, agitated, or exalted moods; diminishing number of ideas; failure of memory for both recent and old events; loss of ethical and esthetic sense; moral obtuseness; and total lack of insight.

1. Only the typical case presents such orderly combination and progression of symptoms as here set forth. However, the average case will exhibit many of the symptoms in varying degree. Especially evident, on the mental side, will be a change in disposition and character, impairment of judgment, loss of the ethical and esthetic sense, and moral obtuseness, the latter in particular showing utter disregard of the proprieties and flagrant immoralities; for example, a deacon of the church brought a prostitute into his home and insisted his wife give her the guest chamber.
2. In paresis, the delusions show a combination of childishness and grandiosity not seen in any other psychosis. Their triviality and fantastic enormity suggest regression to childish make-believe and wish-fulfillment, for the patient playfully remarks "I am a Spanish onion", and then explains he is president, czar, king, God, at one and the same time, will bring the Pacific ocean over the Andes to make the greatest waterfall in the world; has lost billions, been committed to prison for thousands of years, and weeps because unable to do his duty by the nations he governs. However, the delusions may be and not infrequently are depressive, nihilistic, accusatory, and persecutory.
3. Remissions, lasting weeks or months, often occur during the fully developed period. Amelioration of symptoms is chiefly on the mental side, but some of the physical symptoms may also show a change for the better. The improvement may be phenomenal, and the patient change from a state of almost total mental dilapidation to apparent lucidity. Following remissions, the patient is apt to grow worse rapidly.

(3) *Terminal period.*—This is the stage of rapid progression toward complete dementia. The remains of old grandiose delusions may still be noted in the scarcely comprehensible mumblings of the parietic dement, but usually the mind becomes completely vacuous, the patient speechless, filthy in habit, and helpless as an infant. Paralysis of the muscles of deglutition makes tube feeding necessary to prevent strangling; and he lies in bed, wetting and soiling himself, and requiring much care lest contractures and bedsores develop. Like a decerebrate animal, he grunts or snarls when disturbed, and the merely vegetative existence is prolonged solely through the lower cerebral and bulbar neuronic mechanisms until death supervenes.

b. Some authors, instead of describing the development in three periods, describe four clinical varieties; demented, expansive, maniacal, and depressive. In each, the physical symptoms run the usual course with steady progression toward dementia, the essential feature on the mental side. In the demented type, there is progressive mental deterioration without great excitement, exaltation, or depression; in the expansive type, delusions of exaltation predominate in either moderate or exaggerated degree; in the maniacal, the manifestations so resemble those of the manic phase of manic-depressive psychosis as to require special care in diagnosis; and in the depressive, hypochondriacal and self-accusatory delusions predominate sometimes with persecutory trends, creating a resemblance to the depressive phase of manic-depressive psychosis. The individual's personality organization has underlying complexes, problems, and experiences which influence and color the patient's mental reaction. Stuporous, circular, and convulsive forms also have been described. In the latter, convulsive seizures are the outstanding clinical feature. The occurrence of convulsive seizures after the age of 30 and without a history of previous attacks, should arouse suspicion of paresis.

96. Tabetic forms.—Tabetic signs, such as loss of reflexes, ataxia, positive Romberg, paralysis of rectum and bladder, lancinating pains, and girdle symptoms, occur in from 16 to 24 percent of cases. These cases are called taboparesis and seem not to be precisely the same as either tabes or paresis, but a composite with variations from type in each component; that is, an ill-defined tabes and a modified paresis. In fact tabes has been called "spinal paresis," and paresis, "cerebral tabes."

97. Summary of mental symptoms.—*a.* Clouding of consciousness and disorientation occur in varying degree throughout the disease, being very marked in the terminal period.

b. Delusions may be hypochondriacal, depressive, self-accusatory, persecutory, or expansive; the fantastic enormity of the latter exceeds that seen in any other psychosis.

c. Flight of ideas occurs in periods of excitement while diminishing ideation reaches complete paralysis of thought in the terminal period.

d. The mood is one of irritability and changeability in conformity with the ideational content and delusional formation, complaining in the period of onset, euphoric in the fully developed period, and depressive in the terminal period.

e. Memory and attention defects keep pace with the mental deterioration; memory in particular suffers from the beginning, and finally is completely lost.

f. Impairment of reasoning and judgment early manifests itself in uncertainties and contradictions, develops rapidly, and culminates in absurd business transactions and ruinous undertakings.

g. Character, personality, conduct, and behavior are disastrously affected. There is a profound change in disposition, habit of thought and action, with dulling of the finer feelings and degradation of the whole moral nature.

98. Differential diagnosis.—a. It is a cardinal principle that every case of neurasthenia must be proved not to be paresis. The early stages of paresis are differentiated from neurasthenia as follows:

	Paresis	Neurasthenia
Pupils.....	Abnormal reactions.....	Normal.
Reflexes.....	Commonly exaggerated.....	Normal.
Insight.....	At first complains, later protests is not ill, lacks insight.	Never has insight but introspective-ness persists throughout illness.
Symptoms.....	At first mentioned, later minimized.	Always exaggerated.
Spinal fluid.....	Positive Wasserman, increased cell count, increased globulin, positive colloidal gold test.	Normal.
Effect of rest and quiet.....	No improvement.....	Improvement probable.
Mental and moral deteriora-tion.	Noticeable.....	None.

b. The differentiation from cerebral syphilis is often quite difficult.

	Paresis	Cerebral syphilis
Speech disturbances.....	Paretic type.....	If present, is true aphasia due to focal lesions.
Paralyses.....	If present, are transient.....	If present, are permanent.
Lymphocytosis.....	Invariably present, 15 to 50 per cubic millimeter.	Inconstant, slight or absent, endarteritic and gummatous types. Usually extremely marked in meningitic types, 100 to 1,500 cells.
Age.....	Middle life.....	Under 30.
Symptoms.....	Minimized.....	Very anxious concerning condition.
Headache.....	Not characteristic.....	Nocturnal and common.
Delusions.....	Childish make-believe and fantastic enormity.	Rare.
Colloidal gold tests.....	Paretic curve.....	Luetic curve.

c. From tabes dorsalis, the differentiation may be impossible and it may be necessary to await developments. However, a tentative diagnosis of paresis is in order if there is retention of knee jerks associated with mental deterioration.

d. Cerebral tumor presents focal symptoms, choked disk, severe and localized headaches, slow pulse, and usually attacks of protracted stupor.

e. Schizophrenia usually may be differentiated by the presence of catatonic features, tendency of consciousness to remain unclouded and orientation undisturbed, mental deterioration to develop more slowly and by the absence of the characteristic parietic physical signs.

f. The manic and depressive phases of manic-depressive psychosis are differentiated from the maniacal and depressive phases of paresis by the absence of mental deterioration and by serological examination of spinal fluid.

99. Treatment.—a. Malaria is still the most popular form of treatment for general paralysis in spite of the numerous attempts which have been made to supersede it by other forms of pyrexial therapy. Its popularity with clinicians is derived not so much from the high measure of complete recoveries achieved as from its relative immunity to serious accidents. In thus combining a moderate degree of success with comparative safety, it has proved itself superior to and generally more acceptable than any of its rival methods of treatment. It was first used by Wagner von Jauregg of Vienna in 1917, for which he received the Nobel Prize in Medicine in 1927.

b. Malaria fever is produced in the patient either by direct inoculation by the mosquito or by transferring active blood from one patient to another. Technique varies with the individual. However, from 5 cc. to 10 cc. of activated blood have been inoculated directly into the vein of the recipient. The incubation period after intravenous injection is about 10 days. An average of ten paroxysms is allowed, after which quinine therapy is used to halt the fever. Thirty grains of quinine hydrochloride daily for 3 days followed by fifteen grains daily for 3 weeks have been found sufficient in the average patient to stop paroxysms. It has been the practice to give some form of bismuth following malaria therapy, which seems to act as a tonic as well as having specific value. Tryparsamide is being used to a certain extent as a follow-up treatment. The majority of malaria deaths can be eliminated if care is taken in controlling the malaria paroxysms and treating concurrent conditions, such as cardiovascular complications.

c. Benefit from malaria treatment becomes apparent in from 2 to 6 months. An average of between 30 to 40 percent of patients show complete remission from 1 to 2 years after treatment, while 25 to 30 percent show a partial remission. After 10 years, the average for remission is about 15 percent although many more maintain improvement.

d. More than one course of malaria therapy has no effect. There is no similarity that is proportionately between the clinical improvement and the serological. Usually there is no change in serological findings.

e. The mechanism by which malaria operates is unknown. However, it is recognized that there is something besides the fever that is active in destroying the spirochetes. The most common theory is that malaria influences the reticulo-endothelial system, increasing the inflammatory reaction of the cells, and promoting phagocytosis.

f. Tryparsamide is now in common use and the results are almost as satisfactory in the treatment of neurosyphilis as they are with malaria therapy. Here serological improvement is noted as well. It is a good rule that if no serological improvement is noted after 1 year of intensive treatment, no clinical improvement is to be expected from its use. Tryparsamide seems to pass the blood-brain barrier and it has a special affinity for the cells of the nervous system. For this reason, it sometimes causes amblyopia. However, this complication appears early if at all, and usually during the first five to ten injections. If the drug is stopped immediately, recovery is the rule. The dosage is not the determining factor in the production of eye symptoms.

g. Typhoid, paratyphoid, rat-bite fever, milk, diathermy, radiotherapy, etc., have been used to produce pyrexia, but malaria seems to be the most efficient.

SECTION XVII

TABES DORSALIS

(Locomotor ataxia and posterior spinal sclerosis)

	Paragraph
Definition	100
Etiology	101
Pathology	102
Symptoms	103
Diagnosis	104
Differential diagnosis	105
Prognosis	106
Treatment	107

100. Definition.—Tabes dorsalis is a chronic, more or less progressive disease of the central nervous system, exhibiting its chief morbid changes in the spinal ganglia and in the posterior roots and posterior columns of the spinal cord; it is characterized clinically by a very definite series of symptoms, among which the Argyll-Robertson pupil, the lightning pains, the girdle sensations, the loss

of deep reflexes, the hypotonia, and the ataxic gait are the most prominent.

101. Etiology.—In the great majority of cases a history or symptoms of a syphilitic infection can be obtained and syphilitic infection is the almost universal cause of the disease. Pseudotabetic syndromes are known to occur in multiple sclerosis, in tumor, in caries, from accident, gun-shot wounds, in poisoning, by alcohol, pellagra, hypothyroid states, diabetes, ergot, and various other etiological factors. However, in true tabes dorsalis, syphilitic infection is the etiological factor. Tabes appears as a rule 5 to 20 years after the initial infection. Sachs, in Osler's Modern Medicine, records a case of a man of 55 in whom the first symptoms of tabes, including optic atrophy, appeared within 1 year of the initial infection and states that when syphilis is acquired late in life, syphilitic forms of spinal disease may appear within a very few years.

102. Pathology.—The chief anatomical change is a degeneration of the posterior columns of the cord. This change usually begins in the columns of Burdach at the level of the upper lumbar segment. At higher levels, the columns of Goll are also involved at a very early period of the disease. At a later stage, the entire posterior columns of the lumbar and dorsal segments are completely degenerated. The disease is not strictly limited to the posterior columns; the columns of Clarke and the posterior horns are frequently involved. The morbid process may extend into the medulla oblongata involving certain cranial nerves. Especially frequent is the degeneration of the optic nerve (simple white atrophy).

103. Symptoms.—With the possible exception of general paresis, there is no disease presenting such a great number of symptoms and it is doubtful whether any one patient presents even a bare majority of them. Sachs describes two distinct groups of symptoms; the ataxic and the ophthalmic. The ataxic group represents the classical type. In this group, the optic nerve symptoms are developed very late or not at all, while all the ataxic and sensory symptoms attain fullest development. In the ophthalmic group, optic nerve atrophy is one of the earliest and most profound features, leading to early blindness, while the ataxic symptoms are imperfectly exhibited. It has been the rule to divide the symptoms into those of the prodromal stage and those of the ataxic stage. The prodromal stage may last for months or years and yet the final diagnosis cannot be safely established until several of the cardinal symptoms have appeared. The presence of three of the cardinal symptoms is sufficient for this purpose, and among those cardinal symptoms subjective as well as

objective must be ranked. The cardinal symptoms of tabes dorsalis given approximately in their order of importance are—

- a. Lancinating pains, according to Erb, in 90 percent of cases.
- b. Argyll-Robertson pupil, in 80 to 90 percent of all cases.
- c. Loss of deep reflexes, particularly of the knee jerks and Achilles tendon reflex, in 95 percent of all cases.
- d. Romberg symptom.
- e. Girdle sensation in various forms.
- f. Hypotonia of the muscles.
- g. Bladder disturbances.
- h. Ataxic movements of the lower extremities.
- i. Sexual weakness.
- j. Cranial (more particularly ocular) nerve palsies, strabismus, double vision, etc.
- k. Optic nerve atrophy, simple white or primary white atrophy.
- l. Visceral crises.
- m. Trophic disorders, perforating ulcers, etc.
- n. Special mention should also be made of the laryngeal and cardiac crises.

104. **Diagnosis.**—In the fully developed forms, it is hardly possible to mistake tabes for any other disease of the nervous system. If three or more of the cardinal symptoms are present, the diagnosis should be made without hesitation, but it is well to keep in mind that the disease may begin with one or the other of the more unusual symptoms, with visceral crises, laryngeal crises, or with visceral and rectal disturbances. These symptoms may precede the cardinal symptoms for months or years. In the recognition of the earlier stages, evidence furnished by the serological and cytological findings of the blood and spinal fluid will be of the greatest importance.

105. **Differential diagnosis.**—Some of the symptoms of tabes may occur in tumors of the cord invading first the posterior half of the cord, and in multiple sclerosis, if the sclerotic areas happen to involve the posterior columns and the posterior gray matter rather than the pyramidal tracts in which they generally occur. However in doubtful cases, the occurrence of nystagmus, of altered speech, and the ataxic tremor will help to indicate the disease. Greater difficulty will be encountered in differentiating between a syphilitic meningomyelitis invading the posterior half of the cord and genuine tabes dorsalis. Here complete immobility of the pupils, paralysis associated with the ataxia at an early stage of the disease, marked remissions and exacerbations of the symptoms, would help to indicate an active luetic process rather than a typical posterior

spinal sclerosis. The ataxic paraplegia of combined sclerosis may offer even more difficulty if at some stage of the disease the ataxia may predominate to such an extent that the patient may present so few of the spastic and paralytic symptoms that there is little reason to suspect anything else than *tabes dorsalis*. If the ataxic symptoms are associated with increase of reflexes and if the pupillary phenomena are not typical of *tabes*, the diagnosis of combined sclerosis may safely be made. The greatest difficulty will be in differentiating *tabes* from alcoholic multiple neuritis, or as formerly called, alcoholic pseudo-*tabes*. The resemblance to *tabes* lies in the ataxic movements of the lower extremities and in the absence of the deep reflexes, also in the occurrence every now and then of marked sensory disturbances. The differentiating points are that in alcoholic pseudo-*tabes* the pupillary phenomena are not so constant although there is often a sluggish reaction to light; there is almost invariably a considerable degree of paralysis with the ataxia, often also some muscular wasting; lancinating pains and girdle sensations are not the rule in multiple neuritis due to alcoholism and the entire development of the symptoms is more rapid than in *tabes*.

106. Prognosis.—As far as a cure is concerned, the prognosis is hopeless. There are, however, so-called benign cases and the possibility of the degenerative changes coming to a standstill at any period of development must not be overlooked in prognosticating. Many cases are very slow in progressing and many a patient is able to attend to his routine duties and live a fairly comfortable life for many years. The more hopeless cases are those developing an early amaurotic type of *tabes*, and where an early complication with a cystitis or a pyelonephritis occurs. The average duration is from 10 to 15 years.

107. Treatment.—Treatment of the individual case is the method to be sought for. The following is quoted from the Year Book of Neurology, Psychiatry, Endocrinology for 1934: "The abundant literature of the year 1934 has not produced universally accepted conclusions as to the therapy of choice in regard to general paresis, *tabes dorsalis*, meningovascular or asymptomatic forms of syphilis. The consensus of opinion seems to be that an individual approach should be made to the given case, scrutinizing the constitution, the reaction type, and the physical condition before the most promising method of therapeutic endeavors is instituted. The use of antisiphilitic drugs, particularly arsphenamine, tryparsamide, bismuth, mercury, and iodides affords an opportunity for the arrest and finally for the cure of various types of syphilis of the central nervous system. Nonspecific therapy with malaria, relapsing fever, typhoid vaccine, *sodoku*, *pyrifer* or sulphur

injections, and diathermy are the newer methods of combating and arresting the pathologic processes of neurosyphilis. Both methods, singly or combined, have given excellent results. The scientific dispute over the pathogenetic problems leading to neurosyphilis is not settled as yet. The formerly accepted division of the spirochete into a neurotropic and dermatropic type has been discarded since subsequent researches on this question have not supported such a simple working thesis. It is much more plausible to assume variable reactive defense mechanisms in individuals for the developmental course in syphilis, conditioned by such important factors as environment with its physical and emotional strain and trauma, the biological reactions of the skin, vascular and nervous system upon insufficient antisiphilitic therapy, or defective forces in the tissue immunity against the spirochetes. The clinical plus the serological syndrome, the elapsed time of the latent infection, the previous and last methods of therapy, and especially the present physical-mental status determine in each case the antisiphilitic procedures to be followed."

SECTION XVIII

INFECTION EXHAUSTION, TOXIC, AND SYMPTOMATIC
PSYCHOSES

	Paragraph
General.....	108
Etiology.....	109
Infection exhaustion psychoses	110
Symptomatology	111
Differential diagnosis.....	112
Toxic psychoses.....	113
Symptomatic psychoses.....	114

108. General.—Because of the close relationship and for convenience of description, the psychoses are grouped together for discussion. There is no group of mental reactions more important to all medical men than the toxic psychoses. Considered from a broad standpoint, it is clear that in this field there is no division or demarcation between internal medicine and psychiatry. It must be realized that in any physical disease, infection, cardiac disease, metabolic disorder, or glandular disfunction may be abruptly transformed into mental disease. In other words, it must be anticipated that in the course of any physical disease, such phenomena as disturbance of consciousness, hallucinosis, hyperactivity, and other symptoms may appear. These symptoms are simply a part of and a continuation of the same condition which a short time ago may have been a simple uncomplicated case of lobar pneumonia, typhoid fever, myocarditis, or similar disease. It is

obvious that the infective exhaustive and the toxic psychiatric reactions are extraordinarily common. Naturally the majority of these cases are not committed to mental hospitals so there is a discrepancy between the statistics from mental hospitals and the actual number of cases.

109. Etiology.—One of the cardinal and distinguishing traits of these psychoses is the definite etiology. A wide range is covered, but usually the cause is ascertainable. It may be strictly exogenous, and in this connection alcohol, opium and its derivatives, and the entire class of hypnotic and narcotic drugs, the metals and gases used in the industries, etc., are considered. When attention is turned to endogenous agents, the host of acute infectious diseases such as typhoid fever, influenza, and pneumonia is thought of at once. Here the mental equilibrium may be upset by the fever primarily, or by the toxin. Usually both are operative. Then the effect of more chronic infections, notably tuberculosis, must be reckoned with. Heart disease, particularly in the stage of decompensation, exerts a decided influence on mental functioning. Again, there is a whole series of chemical alterations, blood dyscrasias, metabolic disturbances and deprivations, and endocrine imbalances which are expressed not solely in terms of organic disfunctions but often and sometimes predominantly as psychic disorders. As Noyes states, "Unless the organism is intact at physical, chemical, and physiological levels, its operation at the psychobiological level or level of personality functioning, may be impaired to a varying degree."

110. Infection exhaustion psychoses.—*a.* Individual resistiveness and stability of nervous organization seem to be the factors determining the presence, absence, or degree of mental disturbance in conditions of infection and exhaustion. In some individuals, consciousness remains clear notwithstanding a temperature as high as 106° F., while others become delirious with only a slight rise above normal. In the one case, resistance is very marked, in the other, lack of resistance is very evident. In conditions of infection and exhaustion, the hallucinatory and delusional manifestations as well as the disorientation and clouding of consciousness vary widely, are disproportionate to the etiological factors and lack of fixity, and are extremely multiform and changeable. Concerning mental disturbances in the infections the following differentiations are made:

(1) *Initial delirium.*—Developing during the prodromal or incubation period or before the febrile stage.

(2) *Febrile delirium.*—Having a definite relation to the febrile stage.

(3) *Post febrile delirium*.—Developing during the period of defervescence and convalescence (collapse delirium included).

b. Under mental disturbances attending exhaustion are included these manifestations resulting from exhaustion from any cause, as hemorrhage, starvation, severe physical overexertion, severe mental shock, wasting diseases, prolonged insomnia, prolonged worry, and prolonged convalescence from infections.

111. **Symptomatology**.—The symptom-complex is a delirium. Following a few days of insomnia and restlessness, there develops very rapidly a condition of motor excitement with clouding of consciousness, dreamy hallucinations, and delusions. Orientation is quickly lost; the patients become noisy and talkative; the contents of speech show great incoherence, sometimes with a flight of ideas. In emotional attitude there is much exaltation as a rule though occasionally depression with anxiety may predominate the emotional tone. The motor excitement is very pronounced. The patients remove their clothing, race about the room, overturn furniture, pound the door, and attempt to escape. Physically, following the onset and during the height of the disease, there is great insomnia. They take little nourishment and there is marked loss of flesh and physical weakness. Many cases require mechanical feeding. The course is short, the condition rarely lasting over 2 weeks. The return to consciousness is usually sudden and relapses are rare.

112. **Differential diagnosis**.—The condition must be differentiated from epileptic dazedness, delirium tremens, catatonic excitement, paresis, and the acute mania of manic-depressive psychoses.

113. **Toxic psychoses**.—Under this classification will be considered the mental disturbances resulting from alcohol, which includes ordinary intoxication, pathological intoxication, delirium tremens, Korsakow's psychosis, acute hallucinosis, chronic hallucinosis, acute paranoid type, chronic paranoid type, alcoholic deterioration (in the chronic drinker), and dipsomania; and drugs and other exogenous poisons.

a. *Alcohol*.—Over-indulgence in alcohol may be a symptom of or incidental to some psychosis not alcoholic. Excepting ordinary intoxication, all the psychoses described below are precipitated by chronic drinking. At the present time, the tendency is to consider acute alcoholic hallucinosis as a symptom-complex which is liberated by the alcoholic excess, and a psychogenic reaction rather than a reaction due to the toxic action of the alcohol.

(1) *Ordinary intoxication*.—The higher psychic centers are inhibited, resulting in apparent stimulation; then follows paralysis of

the centers controlling muscular coordination; then sensory disturbances; followed in extreme cases by coma and death. The mood is either exalted or depressed.

(2) *Pathological intoxication*.—There is an unusual or abnormal immediate reaction to taking a large or small amount of alcohol. It is essentially an acute mental disturbance of short duration characterized usually by an excitement or furor with hallucinations and delusions, followed by amnesia.

(3) *Delirium tremens*.—This is an acute hallucinatory condition with marked general tremor and toxic symptoms. It may occur as the result of a prolonged debauch in connection with a traumatism or as the initial symptom of an acute illness, in each instance the subject being a chronic alcoholic. The hallucinations are auditory, visual, haptic, and disagreeable. Disorientation is apt to be complete and psychomotor activity marked. Obviously, the above manifestations are accompanied in the emotional sphere by a mood of constant apprehension and fear concerning the terrifying environment. On the contrary, some patients may remain calm, even finding interest and amusement in their delirious experience.

(4) *Korsakow's psychosis*.—This is often called a chronic alcoholic delirium in contradistinction from delirium tremens which is an acute alcoholic delirium. This disorder is the mental state accompanying polyneuritis and is usually of alcoholic origin, but may be induced by various other poisons, the polyneuritis being very slight. In the alcoholic type, an ordinary delirium tremens merges into a protracted delirium known as Korsakow's psychosis with anterograde amnesia, paramnesia, and disorientation. There is composure of manner and apparent lucidity while paramnesia is manifested by filling in the gaps resulting from disordered perception with falsifications of memory, aptly called "opportune confabulation."

(5) *Acute hallucinosis*.—This is chiefly an auditory hallucinosis of rapid development with clearness of the sensorium, but with marked fears and a more or less systematized persecutory trend.

(6) *Chronic hallucinosis*.—This is an infrequent type which may be regarded as the persistence of the acute hallucinosis without change in the character of the symptoms except perhaps a gradual lessening of the emotional reaction accompanying the hallucinations.

(7) *Acute paranoid type*.—This type has suspicions, misinterpretations, persecutory ideas, and often a jealous trend; the hallucinations are usually subordinate, and the condition clears up on the withdrawal of alcohol.

(8) *Chronic paranoid type*.—This type is characterized by persistence of symptoms of the acute paranoid type with fixed delusions

of persecution or jealousy, usually not influenced by withdrawal of alcohol; difficult to differentiate from nonalcoholic paranoid states or dementia praecox.

(9) *Alcoholic deterioration*.—This is a gradual and progressive intellectual, moral, esthetic, emotional, and volitional deterioration in the chronic drinker; relatively few cases are admitted to institutional care because the mental symptoms are not apt to be considered sufficient to warrant the diagnosis of a definite psychosis. On the psychical side the chief symptoms are insidious but progressive intellectual enfeeblement; flagrant immoralities; indifference concerning inefficiency; misery and humiliation of family, and comprised honor; loss of the esthetic sense; ill humor, irascibility or a jovial, careless, facetious mood; diminished inclination and capacity for mental application with disinclination to undertake new work and tendency to continue in the same course. These diverse manifestations, in range, degree, fluctuation, and course, variously but none the less unmistakably, indicate lessening efficiency and moral decay. The physical changes are equally disastrous, involving as they do the stomach, pancreas, liver, kidneys, spleen, blood vessels, and nervous system, central as well as peripheral.

(10) *Dipsomania*.—This is a periodic impulse to drink and is to be interpreted as evidence of a deep-seated constitutional inferiority.

b. Drugs and other exogenous poisons.—(1) *Opium*.—A single dose causes mild stimulation of the mental faculties, followed by a quiet, half-waking, half-sleeping period interrupted by multiform pleasant hallucinations (predominating visual). The prolonged use produces a train of somatic disturbances and results in mental and moral deterioration.

(2) *Cocaine*.—A single dose produces marked stimulation but the effects are fleeting and the dose must be frequently renewed. The prolonged use produces, as with opium, a train of somatic disturbances and results in mental and moral deterioration. Opium causes miosis; cocaine, mydriasis. In neither are there apt to be found the degenerative tissue changes seen in alcoholic habitues. The cocaine habit is more difficult to overcome than addiction to either alcohol or morphine, because the effects are more dominating and disintegrating.

(3) *Other drugs*.—Various other drugs, as bromine, chloral, cannabis indica, hyocyamus, belladonna, etc.; metals, as arsenic and lead; and gases produce psychotic symptoms and should be kept in mind in making diagnosis.

114. Symptomatic psychoses.—Under this classification will be considered those mental disorders, either associated with or symptomatic of, certain bodily diseases. Auto-toxic psychoses, thyroigenous psychoses, and psychoses with certain nervous diseases are described below.

a. Auto-toxic psychoses.—(1) *Uremia.*—The uremic convulsion cannot be distinguished in its outward manifestations from the ordinary epileptic attack. Acute uremic conditions may present hallucinations, delusions, dream states, disorientation, disturbances of the sensorium, and increased psychomotor activity. Usually in chronic uremia there are marked mental symptoms. There is apt to be a general stupidity, irritability, tremor, ocular palsies, speech disturbances, pupillary differences, and sluggish or failing light reactions. If along with these symptoms there are Jacksonian attacks followed by monoplegia or hemiplegia with aphasia and visual disturbances, the similarity to paresis on the one hand, or to brain tumor on the other, may be very great. The mood may be depressed or euphoric. Some cases of uremic psychosis resemble dementia praecox presenting negativism and catatonic symptoms.

(2) *Diabetes.*—In this disease there is often a mild depression with ideas of ruin or sin, or paranoid ideas may develop. The clinical picture may create the impression of paresis.

(3) *Gastro-intestinal conditions.*—The mood in these conditions is usually one of depression, with psychoneurotic rather than psychotic symptoms.

b. Thyroigenous psychoses.—These psychoses may be divided into two classes, those due to deficient secretion (the hypothyreoses) including myxoedema and cretinism; and those due to increased glandular action (the hyperthyreoses) represented by exophthalmic goitre.

(1) *Myxoedema.*—The thyroid gland atrophies, or becomes diseased during adolescence or later. There are pronounced indications on the mental side, usually those of defect. There is defect of memory, attention is diminished, thinking and speech slow with poor apprehension, loss of initiative, motor reluctance, and emotional dullness. The whole picture is one of advancing stupidity, going on, if there is no relief, to dementia. On the physical side, there are characteristic integumentary and nervous symptoms. The skin is thickened, dry, rough, inelastic, particularly in the supravicular region, over the upper arms and the abdominal wall, and the facial lines of expression are obliterated, producing a physiognomy expressing immobility and stupidity. The nose is broad, the lips thick, the tongue thick and unwieldy, and the speech rough and monotonous, the hairy growths are scanty, the hairs dry

and brittle, the nails deformed and brittle, and the hands and fingers misshapen. The skin and mucous membranes become anaemic, very sensitive to cold, the menses cease, and the temperature becomes sub-normal. The nervous symptoms are headache, vertigo, fainting, convulsive attacks, and fine tremors.

(2) *Cretinism*.—This appears during the first and second years of childhood and there is an arrest of somatic and psychic development dependent generally upon a goitre and more rarely upon atrophy of the thyroid gland. The child is dull, stupid, indifferent, sleepy, not learning to walk or talk, and slow and awkward in movement. The patients continue indifferent and phlegmatic, fail to develop mentally, and remain at about the 5-year level.

The long bones thicken and do not increase in length, the head is large, the neck short and thick, nose broad, ears prominent, and the skin thickened as though padded, and in places, especially the neck, hanging in folds. The characteristic physiognomy with the pudgy legs, scanty hair, defective teeth, coarse inarticulate speech sounds, and the unwieldy cumbersome gait, presents a picture quite unmistakable.

(3) *Exophthalmic goitre*.—The prevailing mental tone is that of fear and apprehension. There is emotional irritability and changeability, there may be manic phases or profound depressions. There is some tendency to ally the hyperthyreoses with the manic-depressive group and to separate certain manic-depressives as largely conditioned by hyperthyroid activity.

c. *Psychosis with certain nervous diseases*.—(1) *Sydenham's chorea*.—In addition to the adiodokokinesis and asynergia on the physical side, there is on the mental side, irritability, fretfulness, and emotional instability. Some cases develop terrifying dreams and hallucinations. Korsakow's psychosis may appear as a result of polyneuritis from over-treatment with arsenic.

(2) *Huntingdon's chorea*.—There is a tendency to mental deterioration with depression and suspiciousness.

(3) *Paralysis agitans*.—This is often characterized by a mild degree of mental deterioration. As this is a disease of later life, it should be remembered that arteriosclerosis and senile changes may contribute toward the mental enfeeblement. Occasionally patients develop a well-marked psychosis of a depressive hypochondriacal character with paranoid coloring.

(4) *Multiple sclerosis*.—There may be slight mental impairment, but the principle manifestations are in the emotional sphere shown by instability.

(5) *Korsakow's psychosis*.—See paragraph 112a (4).

(6) *Encephalitis lethargica*.—There is no psychosis peculiar to this infection. The mental changes observed are usually of an emotional nature and show as behavior disorders or regressions to earlier methods of reacting.

SECTION XIX

PSYCHOSES ASSOCIATED WITH ORGANIC DISEASES OF, AND INJURY TO, THE BRAIN

	Paragraph
General	115
Psychoses with cerebral syphilis.....	116
Psychoses with brain tumor.....	117
Traumatic psychoses	118

115. General.—Psychoses associated with organic disease of, and injury to, the brain are epilepsy, described in section XI; psychoses with cerebral syphilis; psychoses with brain tumor; and traumatic psychoses.

116. Psychoses with cerebral syphilis.—General paresis is a parenchymatous form of brain syphilis; cerebral syphilis is an interstitial form. Differentiation between paresis and cerebral syphilis is important because of the difference in symptomatology, course, and prognosis.

a. Types.—In accordance with the predominating pathological characteristics, three types of cerebral syphilis are distinguished; endarteritic, meningitic, and gummatous. In none of the forms are psychotic symptoms as manifest as in paresis, and the personality is much better preserved as shown by the social reactions, ethical sense, judgment, and general behavior. The grotesque and grandiose delusions of the paretic are rarely shown by the victim of cerebral syphilis.

(1) The endarteritic type is the most common. It is difficult to distinguish from cerebral arteriosclerosis, the clinical manifestations being essentially the same.

(2) The meningitic type is next in frequency. It usually develops within 5 years after the initial lesion and reaches complete development in two or three weeks.

(a) Physical symptoms.—In order of importance these are headache, dizziness, vomiting, convulsions, and evidences of cranial nerve involvement. The Argyll-Robertson sign is generally absent, but the pupillary reaction to light and distance is likely to be sluggish. A spastic and partly paralytic condition of the lower extremities with increased knee jerks and bilateral and unilateral Babinski is often found.

(b) *Mental symptoms*.—These are very important. The patients very characteristically present a lethargic, typhoid, or semicomatose condition, with a purposeless, hazy motor delirium. From this condition, they may be roused to answer questions in a slow, drawling, dreamy, sleepy manner and may even perform complex acts in response to requests or demands, the while remaining unable to respond to the calls of nature. However in cerebral syphilis, there is no such alteration of the personality as occurs in paresis. The critical faculties are well preserved and the patient remains conscious of his intellectual deficiencies, nor is he by any means indifferent concerning his condition.

(3) The *gummatous type* is infrequent. It is characterized anatomically by one or more gummata originating in the meninges and extending into the brain substance. The physical symptoms resemble those of brain tumor, together with hemianopsia, aphasia, convulsions, hemiplegia, etc., according to the location of the gummata. The mental symptoms resemble those of the meningitic type.

b. *Prognosis*.—Early and prompt treatment may produce marked improvement and sometimes a cure. The meningitic cases are most amenable to treatment; the gummatous the most resistant; while the endarteritic, though often showing a change for the better, are least favorable owing to tissue destruction. For differential diagnosis between paresis and cerebral syphilis see study of paresis (sec. XVI).

117. *Psychoses with brain tumor*.—The cause, pathology, or neurological signs of brain tumor will not be considered. Mental symptoms due to brain tumor are not frequently found, however they have been divided into three groups; those due to increased intracranial pressure, those due to site of tumor and the structures injured by it, character changes based on individual personality. Noyes adds a fourth, the depressive and anxious reactions, noted following paralyses, disturbances of vision, headache, vomiting, or epileptic attacks. Increased pressure affects practically all of the mechanisms of the mind because of its interference with the arteriovenous and cerebrospinal circulation. Tumors do not produce characteristic psychologic disturbances because of their locality, as they do produce characteristic neurologic signs. Tumors in the prefrontal and temporal lobes in their early stages produce mental symptoms as well as those in the corpus callosum which takes the form of a childlike dementia. One authority reports 21 of 25 patients with frontal tumors having mental changes, and states that the most constant

symptoms are a peculiar indifference and failure of the patient to realize the seriousness of his condition, a loss of sense of responsibility, impairment of attention, loss of memory for recent events, and of interest and enthusiasm in his usual vocation. In some cases, the symptoms of frontal lobe tumor resemble those of dementia paralytica. Briefly, the most common findings in other parts of the brain are: in temporal lobe involvement are noted visual hallucinations; in the occipital lobe mistakes in calculation; disorientation in tumors of the parietal region; in tumors of the cerebellum, giddiness, ataxia, asynergia and a tendency to fall. Tumors of the brain stem show no mental symptoms. Alterations in personality occur most frequently in tumors of the frontal lobe, but may occur regardless of the site of the tumor and may be manifested in various expressions of personality disorganization. Noyes believes that these personality changes are due to a disturbance of integrating functions and are of psychological rather than of focal significance, and probably merely defensive reactions.

These various mental symptoms noted in brain tumor have been described in detail in order to emphasize their importance, especially in a differential diagnosis between them and the various organic and functional psychoses as well as the minor psychoses.

118. Traumatic psychoses.—Here will be considered those psychotic symptoms of a fairly characteristic type, arising as a direct or obvious consequence of trauma to the head. The amount of damage to the brain may range all the way from extensive tissue destruction to simple concussion or physical shock with or without fracture. The three following classifications comprise the fairly characteristic psychotic manifestations:

a. Traumatic delirium.—Occurs either as an acute (concussion) delirium or as a more protracted delirium resembling the Korsakow complex.

b. Traumatic constitution.—Shown as a gradual post-traumatic change in disposition with vasomotor instability, headaches, fatigability, irritability, or explosive emotional reactions; usually hypersensitiveness to alcohol, and in some cases development of paranoid, hysteroid, or epileptoid symptoms.

c. Post-traumatic mental enfeeblement.—Showing varying degrees of mental reduction with or without aphasic symptoms, epileptiform attacks, or development of a cerebral arteriosclerosis.

SECTION XX

SENILE PSYCHOSES

General	Paragraph 119
Types	120

119. General.—There is nothing more inevitable than old age, and although the active flying personnel of the Air Corps does not have the same opportunity of attaining this state as do others in the Army, flight surgeons will have a certain proportion who reach senility to contend with. As Noyes states, the essential features of the senile psychoses are a progressive impoverishment of mental resources and a gradual regression of the personality incident to an advancing dissolution of the highly specialized nerve tissue during the senile period. The reason this occurs is not known, but it is supposed that it is due to an innate inadequacy in durability of neurones. The pathology is interesting. There is a general reduction in brain volume, and the concomitant dementia is proportionate to this reduction. The white matter and gray matter are both diminished in size, as are the basal ganglia, the convolutions are atrophied, especially in the frontal region, with consequent widening of the fissure. The ventricles are dilated, and there is an increased amount of fluid in the subarachnoid spaces. The brain macroscopicall gives the appearance of being worn out. There is a reduction of parenchymatous cells and in the numbers of fibers. There are also two types of amorphous deposits found in these brains; one type is known as corpora amylacea, and the other type as senile plaques. In connection with these senile changes in the brain, sclerosis of the cerebral arteries may also be found, and clinically it is difficult to tell, as Noyes states, which of the two findings is producing the symptoms in a given case. The diagnosis of senile dementia is not difficult. Rarely does senile dementia occur before 60, and retirement is not mandatory until the age of 64. The earliest signs noted are a loss of memory for recent events and a tendency to reminisce, the theme being characteristically personal. Orientation becomes defective, judgment impaired, hallucinations are not uncommon, and at times delusions are apparent. The physical findings are those of senility; thin, atrophied, wrinkled skin, with general bodily deterioration.

120. Types.—Clinical types have been divided into simple deterioration, delirious and confused, depressed and agitated, paranoid, and presenile.

a. The simple deteriorating type is the most commonly noted in senile psychoses; a gradual lessening of contact with the environment until a vegetative, stuporous stage results.

b. The delirious, confused type is as designated. The onset is acute with the patient becoming restless, resistive, and may die of exhaustion.

c. In the depressed and agitated type is found not only memory loss and intellectual impoverishment, but also a persistent agitation with melancholic, hypochondriacal, and nihilistic delusions.

d. The paranoid type is characterized by persecutory delusions. This type of psychosis is again influenced by the prepsychotic life history. With loss of judgment, the delusions become more absurd, hallucinations and illusions are prominent, in fact more than in any of the other types although consciousness and orientation are not disturbed.

e. Presenile psychoses derive their name because of their occurrence between the ages of 40 and 60, or what is termed the presenile period. There are several types which are determined by their difference in histopathology; those usually recognized are Alzheimer's disease, Pick's disease, and presbyophrenia.

(1) In Alzheimer's disease the clinical findings vary, but in general there is fairly rapid mental deterioration, disorientation, memory defect, delirium, disturbances of speech, such as incoherence, aphasia, inability to understand spoken language, disturbances in writing, apraxia, and agnosia. It is a precocious form of senile dementia. The histopathological findings are characterized by tangled thread-like structures occupying much or all of the body of the cortical ganglion cells. These were first noted by Alzheimer, therefore the name "Alzheimer's disease."

(2) Pick's disease is characterized histopathologically by premature focal and extreme atrophy in individuals under 60 years of age. The clinical findings are dependent upon the diffuse and focal processes in the brain. It is an uncommon form of organic mental disease. The microscopic findings are those of degeneration. The white matter atrophies early. The mental symptoms develop rapidly, becoming well established within a year. The most common findings are those of echolalia, alexia, agraphia, and aphasia; the characteristic of the aphasia being that it comes on gradually in comparison to the suddenness noted in vascular disease. The patient usually dies in from 2 to 4 years of some intercurrent infection. Dementia is extreme and cachexia becomes marked. Some believe this condition to be merely senile dementia, others that it is a distinct entity.

(3) Presbyophrenia becomes apparent typically in the presenile stage and usually during the involutional period. It is characterized by confabulation and defect of retention. There is no distinct pathology in presbyophrenia. Some consider it a stage of Alzheimer's disease, and others just an early senile dementia. It is more common in women than in men. Memory is greatly impaired, but the patient covers this impairment by confabulation and these are unnoticed by the patient. This is suggestive of Korsakow's psychosis, the distinguishing feature being the age of the patient as well as the gradual deterioration and onset and absence of neuritic symptoms. Prognosis is hopeless, the course progressive. The diagnosis of simple senile dementia is comparatively easy when we consider the outstanding findings which are first the age, then the characteristic memory loss, and the progressive egocentricity. Differentiation must be made as to involutional melancholia. The points to consider here are the age and the presence or absence of mental deterioration. The question as to cranial arteriosclerosis or senility being present is difficult to determine in some cases. They are at times both present. In considering this differentiation, the presence of exacerbation of mental symptoms, apoplectic attacks, aphasias and neurological findings should be noted. Treatment involves the individual. Patients are usually better satisfied in their accustomed surroundings. However, at times it becomes necessary to institutionalize these patients for the safety and good of the family. It is a foregone conclusion that in the first evidence of any of these signs and symptoms in Air Corps personnel, steps should be taken immediately to remove them from military responsibility. This is of special importance in the event of senile paranoids. They have usually been the defensive paranoid type, and it is difficult to state when the psychotic line is passed. They will compensate the threat to their personality by rendering decisions detrimental to their juniors, because of belief that they are conspiring their downfall. This should be prevented and can only be so done by intelligent medical officers.

SECTION XXI

EPIDEMIC ENCEPHALITIS

	Paragraph
General.....	121
Definition.....	122
History.....	123
Relation to other diseases.....	124
Etiology.....	125
Pathology.....	126
Symptoms.....	127

	Paragraph
Duration and course.....	128
Recurrences.....	129
Sequelae.....	130
Diagnosis.....	131
Prognosis.....	132
Treatment.....	133

121. General.—Because medical officers are brought into contact with large groups of individuals in early adult life, especially during mobilization and war, and as epidemic encephalitis is more prevalent in this age group, it is advisable to give a brief outline and discussion of this disease.

122. Definition.—Epidemic encephalitis is an acute inflammatory infection of the central nervous system, with a special predilection for the gray matter of the brain-stem and basal ganglia. It occurs in epidemic form and presents a variety of clinical types. Sequelae are numerous and there is a marked tendency to recurrence. In its classical form, the disorder is characterized by cranial nerve palsies, a peculiar somnolence or lethargy and symptoms referable to the extrapyramidal system of motility.

123. History.—From the standpoint of modern medicine, this affection must be regarded as a new disease. The first description was given by von Economo in May 1917, based upon the observation of a small epidemic which had occurred in Vienna during the previous winter. He called the affection "encephalitis lethargica." In April of the same year, the French medical men recorded a similar group of cases in France which they termed "subacute encephalomyelitis." The disease represents a new clinical and pathological entity, and while its appearance in epidemic form is new, its occurrence in sporadic form has been observed from time to time in the past. For more than 200 years, the occurrence of lethargy and asthenia as prominent symptoms of an epidemic disease having some of the features of influenza has been noted by medical writers. One such an epidemic occurred in Germany in 1712, to which the name "sleeping sickness" was given; and the disease called "Nona," which appeared in 1890 and 1892, were closely related to this affection. Both of these disorders were associated with epidemics of influenza. Of even greater significance is the electric chorea which appeared in Northern Italy in 1846 and was first observed by Dubini. The resemblance of this group of cases to the myoclonic form of epidemic encephalitis is very striking.

124. Relation to other diseases.—The exact relation which this affection bears to certain other diseases has played an important role in recent investigations. Considerable emphasis has been laid by some

observers on the simultaneous appearance of epidemics of influenza with those of epidemic encephalitis. No constant relationship, however, in the occurrence of the two disorders has been shown to exist. In certain epidemics, encephalitis has been the first to appear, as in the Vienna outbreak in 1916, while at other times influenza preceded the occurrence of encephalitis. However, there has been enough importance given to the association of influenza so that the Veterans' Administration has ruled that encephalitis lethargica is a sequelae of influenza, and therefore a compensable condition. One condition that has occurred frequently, epidemic hiccough, seems more closely related to epidemic encephalitis, if not actually identical with it. In the early history of epidemic encephalitis, certain resemblances to the cerebral forms of poliomyelitis were noted. Both disorders are inflammatory in nature and both have certain epidemiological features in common. There is a difference, however, in seasonal incidence, age susceptibility, mortality, and the localization of the virus. Certain differences in pathological changes are also present. In poliomyelitis, for example, while round cells do occur, it is the polymorphonuclear leukocyte which plays the most conspicuous role. The meninges also show greater involvement and neuronophagocytosis is more common.

125. *Etiology.*—Among the predisposing causes are overwork and worry, the lowering of resistance by infectious disease, and especially influenza. Social conditions and occupation appear to play but a minor role. The comparative infrequency of the disease among nurses and medical men exposed to the infection is worthy of mention.

a. Age.—Epidemic encephalitis is most common in early adult life, but may occur at any age from infancy to old age. It has been observed as early as the second week of life and cases of encephalitis neonatorum have been recorded in which the disease appeared immediately after birth, probably by placental infection.

b. Sex.—The distribution is about equally divided between the two sexes. In Smith's series, 60 percent were males and 40 percent females.

c. Infectivity.—One source of the virus is the nasopharynx. The evidence also suggests that the infectious agent is carried through the air and not conveyed by biting insects, water or food. The disease is not highly infectious and the evidence in favor of personal contagion is very slight. Multiple cases in families and small outbreaks in institutions were observed during the epidemic, as well as infection of the newborn by the mother through nursing or placental transmission. In hospitals and institutions, the instances of direct contagion are very few. Carriers also play a role in dissemination. These may be convalescents or those who have suffered a mild or abortive attack.

Once the infection is established, there is a decided tendency to chronicity and recurrence. An interval of months or even years may elapse between the acute and chronic stage, and like disseminated sclerosis and syphilis, the virus of the disease may remain quiescent in the central nervous system for long periods of time.

d. Incubation period.—This is difficult to determine with accuracy. The evidence indicates that it may vary from 1 day to 2 weeks or even longer.

126. Pathology.—The brain is congested and oedematous, and the seat of numerous inflammatory foci. These are particularly well-marked in the gray matter of the pons and basal ganglia. Inflammatory lesions are also found in the cerebral cortex, in the medulla, and rarely in the cerebellum. They are also rare in the spinal cord. Hemorrhages are often absent but hemorrhagic extravasations, both small and large, may occur. Numerous minute hemorrhages have been found. A group of cases with hemorrhages in the cerebral cortex has been described. In the inflamed areas, there is more or less extensive round-cell infiltration of the gray matter and of the perivascular lymphatic sheaths consisting of large and small mononuclear lymphocytes, polyblasts, and plasma cells. The ganglion cells, unlike poliomyelitis, are not especially involved except in the affected areas, where they may be swollen and show diffuse changes in the chromatin. Neuronophagia is rare. The glia cells sometimes show proliferation. As a rule there are no marked meningeal changes. A mild leptomeningitis has been found. In the chronic stage, evidences of atrophy of the neural structures, both cells and nerve fibres, are manifest. Special medullary stains often reveal a more or less well-defined funicular degeneration in pyramidal tracts, posterior columns, and crus cerebelli. In relapsing cases, evidences of acute and chronic lesions are encountered side by side (von Economo). Some authorities found inflammatory and degenerative changes in the spinal nerve roots and similar changes were found in the trigeminal nerve roots by other authorities. Minute bodies have been reported both within and without the ganglion cells, and suggests a possible relationship to the virus of the disease, they playing the same role in encephalitis as Negri's bodies in rabies. The inflammatory lesions may be very slow in developing and in fatal cases may be absent even after a week's illness.

127. Symptoms.—The clinical manifestations of epidemic encephalitis cover a very wide range in both the acute and chronic stages. There are great variations, both in virulence and localization, so that a large array of clinical types is presented. The sequelae are frequent and many are of unusual character. There is no other acute

inflammatory affection of the central nervous system which is more grave in its immediate effects and more serious in its later consequences. The onset may be either acute or gradual. Tilney states that 6 to 12 percent of the cases have an acute onset; 88 to 94 percent have a gradual onset. The initial symptoms in order of frequency are headache (present in nearly half the cases); lethargy; vomiting; diplopia; change in character; fever; vertigo; general malaise, etc. Thirty-seven symptoms are listed by Tilney, ranging from nearly 50 percent for headache to about 2 percent for speech changes, fits, and conjunctivitis. Rarely the attack may come on so suddenly with loss of consciousness that an apoplectiform seizure is simulated. The general symptomatology is indicative of an infectious process. In a great majority of cases there is moderate fever in the early stage which continues usually for a fortnight and gradually subsides.

a. Tilney gives the following table on "Parts of nervous system involved and resulting focal symptoms."

- | | |
|--|--------------------------|
| 1. Oculomotor nucleus. | Anesthesia. |
| Palsies of extrinsic and intrinsic eye muscles. | Convulsions. |
| | Astereognosis. |
| 2. Basal ganglia—including striatum, thalamus and red nucleus. | 5. Spinal cord. |
| Paralysis agitans. | Myoclenic spasms. |
| Athetosis. | Flaccid paralysis. |
| Chorea. | 6. Dorsal roots. |
| Choreoathetosis. | Radicular pains. |
| Mobile spasm. | 7. Medulla oblongata. |
| Cataleptic rigidity. | Vertigo and tinnitus. |
| Myorhythmic movements. | Nausea and vomiting. |
| Emotional imbalance. | Dyspnea and tachycardia. |
| | Dysphagia. |
| 3. Pons varolii. | Respiratory and cardiac. |
| Facial paralysis. | Death. |
| Abducens paralysis. | 8. Internal capsule. |
| | Hemiplegia. |
| 4. Cerebral cortex. | 9. Optic nerve. |
| Delirium. | Amblyopia. |
| Hallucinosi. | Optic neuritis. |
| Confusion and mania. | Choked disk. |
| Behavior perversions. | |
| Hypersomnia. | 10. Dorsal root ganglia. |
| Insomnia. | Herpes Zoster. |
| Aphasia. | |

b. J. Ramsey Hunt, in Osler's Modern Medicine, quoting A. C. Parson's study of 1,275 cases in Great Britain, lists three great clinical groups, dependent upon the virulence of the infection and localization of the virus in the various nerve centers and pathways to the brain and spinal cord.

I. There is a general disturbance of the functions of the central nervous system without evidences of focal involvement. This type was observed in 6.7 percent of the cases. The general symptoms consist of lethargy, asthenia, and mental dullness; these may be severe in some cases and in others comparatively mild, grading off into the abortive type. In this group, transient ocular palsies were occasionally present.

II. With general disturbances of function there is distinct evidence of focal involvement in the central nervous system. This type comprised 90 percent of the cases distributed as follows:

a. Involvement of the oculomotor nerves—this group corresponds to the classical description of the disease and is characterized by fever, lethargy, and ocular palsies.

b. Involvement of the pons and medulla—in this series all of the cranial nerves may show involvement, but more especially the facial nerve.

c. Involvement of the pyramidal and extra-pyramidal systems—in the former giving rise to hemiplegia, monoplegia, and paraplegia, and in the latter to Parkinsonism, chorea, and athetosis.

d. Ataxic type—this is rare and indicates an involvement of the cerebellar mechanism.

e. Cerebral cortex—in 40 cases, motor symptoms referable to the cerebral cortex were present, including convulsive seizures, Jacksonian epilepsy, and speech disturbances.

f. Spinal cord—the spinal mechanism is rarely involved. In three cases flaccid paralysis of the extremities and in two cases wasting of the arm and leg muscles were noted.

g. Polyneuritic type—this is quite rare. In some cases, there was symmetrical involvement as in multiple neuritis with bilateral foot-drop.

III. This is composed of mild abortive cases. There were 31 cases in this series, with a duration of 2 to 3 weeks, all terminating in complete recovery. This group is characterized by slight fever, sore throat, and gastro-intestinal symptoms with slight or negligible nervous symptoms. Some cases were so mild that their recognition was only possible during the active period of an epidemic. The ambulatory cases belong to this group and are often not recognized before the appearance of transient diplopia.

128. Duration and course.—Of the cases that recover, the duration of the primary disease is from 4 to 8 weeks, somewhat longer in children than in adults. Of the recognized cases, probably less than 20 percent make a complete recovery. Remissions and exacerbations extending over a period of months or years are frequently seen. Recovery with residuals is the rule. In about 60 percent there remain serious and progressive disabilities. Some authorities estimate that fully 90 percent suffer some mental impairment as a result of the disease.

129. Recurrences.—It is well established that there is a well-marked tendency to recurrence. An ominous feature of this tendency is the long interval of time which may elapse between the initial infection and the relapse. In some instances, this has been 2, 3, and even 10 years. Often the original infection was slight and attracted

but little attention. More than one relapse may also occur and in this respect the disorder resembles disseminated sclerosis and syphilis of the central nervous system.

130. Sequelae.—It is difficult to draw a distinct line between the long-continued symptoms of the disease and sequelae. It is becoming more and more common to speak of chronic epidemic encephalitis rather than of conditions present being sequelae of the disease. The most common conditions present in these chronic forms are Parkinsonian syndrome, mental impairment, psychic changes (especially in children), various ocular defects, etc. The most dramatic form is the Parkinsonian syndrome which closely resembles paralysis agitans with its rigidity of expression, fixed stare, and paresis of the facial muscles particularly marked on mimetic innervation and therefore suggestive of thalamic pathology. There is inability to show the teeth properly, difficulty in protruding the tongue, dysarthria, sialorrhoea, champing movements of the lower jaw, and generalized muscular rigidity with Parkinsonian attitude and gait. Intention tremor is often present.

131. Diagnosis.—*a.* Any disease showing the diversity of clinical types and the numerous sequelae of epidemic encephalitis must also present corresponding diagnostic difficulties and uncertainties. Many of the cases, especially those of mild prodromal type, can only be detected during the actual progress of an epidemic. The diagnosis is readily made when the chronic stage follows immediately or soon after the acute phase. It is very difficult, however, if the febrile state was slight or poorly defined or occurred years previously. In the classical form with fever, lethargy, and cranial nerve palsies, and the type characterized by Parkinsonism, the diagnosis is relatively easy.

b. In the early stage symptoms as apathy, drowsiness, headache, and diplopia associated with the general symptoms of infection are very suggestive, and during the course of an epidemic, are almost pathognomonic. Later, when the infection is well established, stupor, alternating with delirium, extreme asthenia, muscular rigidity, cranial nerve palsies, a mask-like expression of face, spontaneous stupor, chorea, or myoclonus may occur and give a characteristic stamp to the disorder. A peculiarity of the cranial nerve palsies is a tendency to amelioration in one distribution as the paralysis appears in another. Optic neuritis is comparatively rare and its absence in the presence of other nerve cerebral symptoms has a certain diagnostic value.

c. In an important group, the mild initial symptoms are not recognized and it is only with the recurrence of the disorder when symp-

toms of paralysis agitans or chorea-athetosis appear that the diagnosis is established. In rare instances, an apoplectic onset has been observed with stupor and paralysis simulating very closely cerebral hemorrhage.

d. Tuberculous and meningococcus meningitis, cerebral tumor and cerebral hemorrhage are the conditions with which this disease is most readily confused.

(1) In meningitis, the examination of the cerebrospinal fluid and the preponderance of meningeal symptoms are important. In the early stage of tuberculous meningitis, the cerebrospinal fluid may be similar to that of lethargic encephalitis. In other forms of meningitis, the spinal fluid changes are usually diagnostic.

(2) In cerebral tumor, the slow progressive course and swelling of the optic nerves usually serve to differentiate but fundus changes resembling those of tumor may occur in the later stages. Encephalitis shows a great tendency to remission and exacerbation and is more polymorphous in its clinical manifestations. In cerebral abscess, there is usually a previous history of trauma or infection of otogenic or rhinogenic origin.

e. Cerebrospinal syphilis is distinguished by the history of infection and the serological reactions. In early life, poliomyelitis may come up for consideration but it has a different seasonal incidence, occurring in warm weather, and the paralysis is of the atrophic flaccid type.

f. The disorder has also been confused with botulism and the early cases of the first epidemic in England were so regarded. Poisoning by narcotic drugs, barbitol luminal, chloral, and morphine may also simulate the clinical picture.

g. In many disorders of the central nervous system, the question of a previous attack of encephalitis is of great importance and in cases of paralysis agitans, chorea, athetosis, dystonia musculorum deformans, and myoclonus multiplex the previous history should be carefully scanned for evidences of a previous attack of encephalitis. This is also true in the psychoses, and especially in children, many obscure psychopathic states and sexual aberrations are sequelae of a previous attack of encephalitis.

h. The classical paralysis agitans appears spontaneously and is not related to a previous infection. It is of gradual onset and progresses very gradually.

i. The clinical field covered by encephalitis is so wide and so varied that the most careful history, physical and mental examination, together with laboratory tests are required to solve the obscure diagnostic problems presented by this disorder.

132. Prognosis.—This should always be guarded. Comparatively mild cases frequently have a severe recurrence and a chronic condition results. The average mortality is given by Tilney as about 25 percent and complete recovery at about 12 percent.

133. Treatment.—No specific treatment for epidemic encephalitis has yet been discovered. Many drugs have been advocated, but only temporary relief has been obtained from any. Rest during the acute period should be strongly emphasized. Also during the convalescent period the treatment is rest. In view of the possibility of contagion, however slight, the patient should be isolated. Further than this, treatment is symptomatic.

SECTION XXII

NEUROLOGY

	Paragraph
General.....	134
Cranial nerves.....	135
Trigeminal nerve.....	136
Facial nerve.....	137
Lesions of the facial nerve.....	138
Glosso-pharyngeal and the pneumogastric nerves.....	139
Accessory.....	140
Hypoglossus.....	141
Articulation.....	142

134. General.—*a.* It is impossible to do more than give a few suggestions in such a broad subject as neurology, but the brief outline given may be of value as a review of some cardinal points. The anamnesis should cover the essential points in the patient's history, his previous life, and the history of his present illness. Allow the patient to tell his own story in his own words. Listen patiently and avoid making suggestions. To complete the history, a few leading questions may have to be asked, particularly about the following symptoms:

Headache.—Constant or intermittent, diffuse or localized; hemicrania.

Vomiting.—With or without a subjective feeling of nausea; projectile; any relation to the taking of food.

Vertigo.—More pronounced in the dark than in the light; tendency to fall to one side; any subjective sensation of rotation.

Disturbance of vision.—First and foremost diplopia (temporary diplopia very frequent in disseminated sclerosis and in syphilitic brain lesions, and in the early stages of encephalitis lethargica).

Pain and parasthesias.—Location, character, radiation, etc., "cushion sensation," "girdle sensation," in tabes, etc.

Disturbances of consciousness.—Loss of consciousness, clouding of consciousness, automatism, petit mal.

Convulsive fits.—Tonic or clonic, general or localized, followed by localized paresis or paralysis.

Bladder trouble.—Precipitate micturition (frequent in disseminated sclerosis); retention; incontinence (ischuria paradoxa).

Constipation.—There is no doubt that many neurotic complaints are accentuated by constipation.

Disorders of sleep.—Insomnia, hypersomnia. In insomnia is it the process of going to sleep that is impeded by pains, by persevering thought, or by anxiety? Does the patient wake up with any peculiar sensation? How many hours does the patient sleep during the day or during the night?

b. It is of great importance to ascertain whether the illness started suddenly (a certain day or a certain hour; this generally indicates a vascular "catastrophe" as hemorrhage, embolism, thrombosis); or gradually (tumors, degenerative lesions); and if there have been remissions (as in disseminated sclerosis).

c. Inquiries about syphilitic infection should always be made, if not directly, then indirectly, such as questions about abortions, stillbirths, rash, etc. Intemperance with regard to alcohol and tobacco or other drugs should be noted, and the quantity consumed should be stated as accurately as possible.

135. *Cranial nerves.*—*a.* Test the olfactory nerve for anosmia by the use of peppermint, camphor, and asafetida. Avoid the use of irritating substances. Anosmia may be due to—

- (1) Tumor of the frontal lobe.
- (2) Cerebellar tumors.
- (3) Atrophy of the olfactory nerves (tabes).
- (4) Hysteria.
- (5) Local lesions (rhinitis).

b. The optic, oculomotor, trochlearis, abducens, and auditory nerves are fully discussed in TM 8-300.

136. *Trigeminal nerve.*—*a. Motor division.*—Innervating all muscles of mastication is tested by having the patient clench his teeth as hard as he can and at the same time the masseter and temporal muscles are tested by palpation. The patient is then directed to open his mouth wide, and any deviation of the lower jaw is noted. In affections of the motor part of the trigeminal, the lower jaw deviates to the side of the lesion because of the deficient action of the pterygoidei muscles.

b. Sensory division.—(1) Sensation of the face and a varying portion of scalp has to be tested by means of—

- (a) A piece of paper or cotton wool (touch).
- (b) Pin pricks (pain).

(c) Test tubes filled with hot and cold water (temperature).

(2) The sensory part of the trigeminal nerve is connected with the contralateral hemisphere only; the motor part with both. The points of exit of the chief sensory nerves are also tested for tenderness (frontal, supraorbital, infraorbital, and mental nerves). In trigeminal neuralgia, these are often excessively tender even between the neuralgic attacks.

137. Facial nerve.—*a.* If the patient's face has a one-sided appearance, this may be due to paresis or paralysis of the one side, to contracture of the other, to a developmental asymmetry, or to unilateral facial atrophy. Test in the following manner:

(1) The patient is asked to raise his eyebrows.

(2) To frown.

(3) To shut his eyes and screw them up as tightly as he can; by then trying to open them against the patient's efforts to keep them closed, an impression of the power of the orbiculares oculi is obtained.

b. The above tests are for the muscles of the upper facial portion which has a bilateral cortical innervation and which consequently is not affected in supranuclear lesions, for example, the ordinarily capsular hemiplegia, or at least not to the same extent as the lower part of the facial muscles. These are tested in the following manner:

(1) The patient is asked to show his teeth.

(2) To blow out his cheeks.

(3) To whistle.

(4) To smile.

c. Many patients, mostly females, smile spontaneously after the effort of whistling. It is important to take note of this as well as of the patient's spontaneous emotional expressions in general.

d. In thalamic lesions, it is often found that there is deficiency or loss of the movements of emotional expression on the opposite side of the face while the above tests (all carried out on the examiner's command and having nothing to do with emotional expression) betray no disturbance.

e. On the other hand, it is commonly found in organic lesions (example, hemiplegia), which have affected the pyramidal fibres to the facial nucleus, that while the patient's voluntary movements (as evidenced to his response to tests 3, 4, and 5) are decidedly paretic yet the emotional innervation, as evidenced by the spontaneous smile, does not betray any paresis. The stiff, mask-like expression in paralysis and in the Parkinson syndrome of encephalitis lethargica is characteristic.

f. Uncontrolled attacks of laughing and crying occur in many nervous diseases, notably in disseminated sclerosis. Characteristic also

is the absolutely blank expression which is encountered in schizophrenia, interrupted now and again by smiles for no apparent reason, probably in response to hallucinations.

g. In the foregoing tests, it is important to note not only any deficiency of movement but also if the movements are accompanied by any tremor. Perioral fibrillary tremor is a sign that is frequently and typically found in dementia paralytica, often very early in the development of the disease. Tremor palpebrarum is a frequent finding also in purely "functional" conditions and has not the same significance as the perioral tremor. Any overaction of the facial movements should also be noted.

138. Lesions of the facial nerve.—*a.* Lesion peripheral to the chorda tympani's leaving the facial trunk produces a paralysis of the whole corresponding side of the face, the upper facial portion included.

b. Lesion central to the departure of the chorda tympani but peripheral to the ganglion geniculi produces paralysis to the whole corresponding side of the face and besides, loss of taste in the anterior two-thirds of the corresponding side of the tongue.

c. Lesion between the ganglion geniculi and pons produces paralysis of the whole corresponding side of the face; no disturbance of taste, but as a rule some deafness, as the acoustic nerve is generally affected. If the acoustic nerve is intact, hyperacusis as a rule obtains on account of the stapedius paralysis, thus in any case a disturbance of hearing.

d. Lesion in the pons itself, nuclear or infra-nuclear, produces paralysis of the whole corresponding half of the face but without any disturbance of taste or hearing. However, as the fibres of the facial nerve come into close relationship to the nucleus and the fibres of the sixth nerve, a facial paralysis of pontine origin is as a rule accompanied by abducens paralysis.

e. In supranuclear lesions the paralysis is never complete and is chiefly or exclusively confined to the lower portion of the face, the upper portion being either intact or much less affected. As the lesion is nearly always situated above the decussation of the pyramidal fibres of the seventh nucleus, the paralysis is found on the opposite side of the lesion.

f. The examination of taste should always be carried out in a case of facial paralysis. The patient is asked to put out his tongue and keep it out during the test. A little powdered sugar, salt, citric acid, and quinine are then placed successively on the tongue and rubbed in with a corner of a towel. The patient must then indicate the sensation he gets by pointing to one of the following words which have

been written up for him; sweet; salt; sour; bitter. Only the anterior two-thirds of the tongue, that portion innervated by the chorda tympani, can be tested in this way. The posterior third, innervated by the glosso-pharyngeus is tested by the use of a wire electrode of copper and a weak galvanic current which elicits a peculiar acid taste.

139. Glosso-pharyngeal and the pneumogastric nerves.—These are generally recorded together as their areas of innervation seem to overlap, or at least cannot be clearly distinguished.

a. The patient is made to open his mouth and say "Ah." In cases of one-sided paresis, the raphe palati deviates to the nonparalyzed side.

b. The patient is made to swallow and the power with which the larynx is pulled upward during the act of deglutition is tested. A convenient method is to let the patient sip from a glass of water. Notice if any regurgitation through the nose takes place and if accompanied by coughing.

c. Any peculiarities of heart and respiratory functions should also be noted.

d. The posterior third of the tongue is tested for taste as described in paragraph 138f.

140. Accessorius (motor nerve for the sterno-cleido-mastoid, and upper part of the trapezius).—

a. The patient is asked to turn his head to the right and to the left; this movement is carried out chiefly by the action of the sterno-cleido-mastoid on the opposite side. The movement is opposed by placing one hand against the patient's chin while the contracting sterno-mastoid is palpated by the other.

b. The upper portion of the trapezius is tested by making the patient shrug his shoulder against resistance.

c. When the upper fibers of the trapezius are paralyzed, the scapula alters position, the upper part of the scapula falling away laterally from the vertebral column.

141. Hypoglossus (motor nerve of the tongue).—The patient is asked to open his mouth and put out his tongue. Note if any deviation takes place on protrusion, if any atrophy, if there are any wrinkles on the tongue, and if they are confined to one side. Note if the tongue fills the whole space inside the lower jaw. In some cases, the tongue cannot be protruded at all (as in advanced bulbar paralysis or myasthenia), or only for a moment (as in myasthenia). If one side is paretic or paralyzed, the tongue will deviate to that side on protrusion. The patient is also asked to move his tongue sideways and to press it against the inside of either cheek, while the strength

of this pressure is tested with the finger on the outside of the patient's cheek.

142. Articulation.—This is a complex coordinated function involving the cooperation of a number of cranial nerves (fifth, seventh, ninth, twelfth). It is most conveniently tested after the examination of the cranial nerves just described. If there is a striking peculiarity of the patient's speech, it probably will have made itself manifest during the patient's narrative of the history. In order to detect latent disturbances of articulation, the patient is asked to pronounce certain test words, as "West Register Street," "British Constitution," "Royal Artillery," "Righteous retribution," "Methodist Episcopal," "Irish Constabulary," "hippopotamus," etc. In bulbar and pseudo-bulbar paralysis, the speech is found to be indistinct; in dementia paralytica, the speech is blurred and hesitating with repetitions and omissions of one or more syllables; in desseminated sclerosis, an explosive staccato speech; and in myasthenia, a speech disturbance which on prolonged effort increases from a light dysarthria to complete anarthria.

SECTION XXIII

SURVEY OF THE NEUROPSYCHIATRIC EXAMINATION

	Paragraph
General.....	143
Classification of tremors.....	144
Psychomotor tension.....	145
Peripheral circulation.....	146
Knee-jerk.....	147
History of applicant.....	148
Use of tobacco, alcohol and medicine.....	149
Epileptic equivalents.....	150
Insomnia.....	151
Memory.....	152
Phobias.....	153
Anxiety.....	154
Cycloids and schizoids.....	155
Extroversion and introversion.....	156
Selection of candidates for flying.....	157

143. General.—*a.* That the value of the neuropsychiatric examination of the applicant for flying training as well as of the pilot in his annual and semiannual examinations is of utmost importance is recognized by all flight surgeons.

b. In many instances, an applicant has arrived at the Air Corps training center, both in the cadet group and in the student officer group, having disqualifications which should have precluded his being accepted for flying training. In some instances, a pilot has been

allowed to fly in spite of disqualifying neuropsychic findings, which either had not been recognized by the examining flight surgeon or the importance of these findings had not been properly evaluated.

c. Under the neurological examination, factors involved such as tic, tremor, psychomotor tension, peripheral circulation, and disturbances of the reflexes are considered as having psychic importance. Spasmodic tic or habit spasm is designated as an "involuntary repetition of some ordinary coordinated purposive act." The characteristic of spasmodic tic is that it can be controlled by mental effort, is increased by emotion, and ceases during sleep. The psychological mechanisms involved will not be entered into. Spasmodic tic or habit spasm is indicative of psychical weakness; however, single spasmodic contractions may develop in normal individuals as a result of great fatigue, nervous exhaustion, or overwork. These usually do not last more than a second, and disappear entirely on removal of the cause. Therefore, any habit spasm or spasmodic tic is disqualifying for flying training, as it is either due to psychical weakness or an organic lesion.

144. Classification of tremors.—Tremors occur when the normally uniform tone of a muscle at rest is replaced by a succession of separately perceptible muscular twitches. They are the most common of all abnormal movements and must be distinguished from fibrillations which are slow vermicular twitchings of individual muscle-fibres or bundles, which may occur anywhere, but do not produce movements of muscles or joints. They are essentially evidence of an organic lesion, usually in the anterior horn cells.

a. Tremors are usually classified as to being slow, moderate, rapid, coarse, medium or fine, regular or irregular. A further classification is that of being fine, unilateral fine, coarse, intention, and toxic. It is impossible to give a definite clinical classification of tremors; however, the more important may be listed as follows:

(1) *Fine tremor.*

(a) Minor psychoses.

1. Hysteria.

2. Neurasthenia.

3. Neurosis, occupational.

(b) Organic.

1. Paralysis agitans.

2. Paresis.

3. Graves' disease.

4. Uremia.

5. Exophthalmic goitre.

- (c) Muscular fatigue or weakness.
- (d) Senile tremor.
- (e) High fever.
- (f) Convalescence.
- (2) *Unilateral fine tremor.*
 - (a) Hysteria.
 - (b) Hemiplegia.
 - (c) Brain tumor.
 - (d) Chorea.
- (3) *Coarse tremor.*
 - (a) Exaggerated fine tremors.
 - (b) Hereditary and familial ataxias.
 - (c) Hemiplegia.
- (4) *Intention tremor.*—
 - (a) Hysteria.
 - (b) Disseminated sclerosis.
 - (c) Some brain lesions.
- (5) *Toxic tremor.*—Various states of toxic poisoning, as—
 - (a) Tobacco.
 - (b) Alcohol.
 - (c) Various drugs.
 - (d) Metals.

b. Fine, unilateral fine, coarse, and intention tremors are found in various types of the minor psychoses and as such are evidences of psychical weakness. Emotional nervousness also produces a fine tremor, and is occasionally found when a raw applicant is examined. This should be seriously considered in the general estimate of the individual.

145. **Psychomotor tension.**—This is an observable indication of the amount of psychomotor activity which results from the action of the psycho-sensory and intrapsychic fields. It interprets the aptitude or inaptitude of the individual to adjust himself to his environment. The perception of the individual as influenced by his intellect is being demonstrated by the tension produced. It demonstrates the ease with which the nervous system is functioning. Therefore, an appreciable increased tension in the applicant should be studied as to cause. In the pilot it is termed "staleness." The test of unexpectedly dropping the examinee's arm, which has been held in a state of relaxation in the examiner's hand, is satisfactory, although a general observation of the examinee during the examination should indicate whether or not there is increased tension present.

146. Peripheral circulation.—Disturbances of the peripheral circulation may be noted in the presence of localized sweating, mottling, and cyanosis of the face, trunk, and extremities. They are themselves evidence of neurocirculatory instability and should be considered as important factors for disqualification.

147. Knee-jerk.—A normal knee-jerk cannot be defined. Normalcy of the knee-jerk is dependent on the type of individual being examined and on the opinion of the examiner. A suitable percussion hammer is essential. The attempt to elicit a patellar response with the fingers or hand is unsatisfactory. The most satisfactory manner of eliciting this important sign is to place the examinee's feet as far away as it is possible for him to do so and still keep the soles of his feet in contact with the floor. In this manner, the various responses are more easily and accurately determined. Enforcement may be necessary at times and is usually produced by having the examinee pull his grasped hands while looking at the ceiling or in performing some other voluntary act. The knee-jerk may be absent, diminished, exaggerated, or unequal. Absent and unequal responses are to be regarded as signs of organic pathology, especially if associated with other reflex changes. The same may be said of the truly diminished response. A sluggish response should not be confused with one that is diminished. The natural variations should be taken into consideration. The exaggerated knee-jerk may be due either to psychogenic or organic conditions and occurs when the reflex arc to the quadriceps is insufficiently controlled by the higher nerve centers. Exaggerated knee-jerks may be considered to be of psychogenic origin when associated with normal abdominal and plantar reflexes. The abnormal reflex findings are to be expected more in those of the older age group than in those of the cadet and student officer group.

148. History of applicant.—Of great importance is the family history of the applicant and perhaps of greater importance is the personal history. The present day opinion is that many of the psychologic problems which are met are due to improper mental hygiene or improper guidance. It is also believed that heredity has been over-emphasized. Basic factors involved are considered to be heredity and environment, but how much either of these is a factor cannot be established at this time. As to heredity, it is evident that the germ cell is injured in certain types of mental disease and will perhaps progenerate organisms favorable to the development of mental disease.

a. In studying the personal history, the individual's conditionings and his life experiences, that is, his environment, must be studied. In the applicant, a family history of direct heredity involving mental disease is a disqualifying factor; knowledge of the factor of heredity

is far from complete, and it is not necessary, with the amount of material from which to choose, to be placed in jeopardy as to the outcome of any applicant. This is well illustrated from two cases selected at random:

(1) Family history: brother an idiot; patient committed suicide.

(2) Family history: father committed suicide, grandmother in hospital for mental diseases. Present illness: schizophrenia; attempted suicide.

b. As to the study of the personal history, paragraph 32a (2) AR 40-110, is quoted in full: "The personal history will be searched on the points below mentioned in order to develop and complete the balance of the examination. The infantile period will be searched for evidences of retardation, and particular study made of the factors which obtained during the formative years and determined the personality trend. To this end study will be made of the family life, play life, sex life, school and college life, trends of thought, athletic tendencies, degree of manual dexterity, personal and family attitude toward flying, reactions concerning the ordinary stresses of life, and particularly the probable reactions under the special stresses incident to flying." If this instructional paragraph is carried out in detail, many of the pitfalls encountered would be avoided. Pilots are not eliminated from flying training nor "grounded" merely because of having schizoid or cycloid personality. It is when these personalities develop psychotic manifestations that elimination and "grounding" are necessary.

149. Use of tobacco, alcohol, and medicine.—*a.* When considering the use of tobacco in its various forms, especially in the applicant, attention should be given as to the excessiveness of its use. Its use may be an outlet for excessive nervous energy or an outlet for repressed tendencies.

b. The use of alcohol should be given careful study. Alcoholism cannot be excused in the applicant, nor should it be in the pilot. Its use is an artificial retreat from reality and reality must be met actively by those engaged in flying.

a. The habitual use of medicines of any sort falls into somewhat the same category. Usually the ailment for which the medicine is used is fancied, which again is evidence of an unstable individual.

150. Epileptic equivalents.—It is the opinion, as substantiated by the findings presented, that a history of any of the so-called epileptic equivalents should be sufficient to disqualify any applicant. Under these epileptoid equivalents are listed enuresis, severe headaches, dizziness, fainting, stammering or stuttering, somnambulism, pavor noc-

turnus, and migraine. More consideration should be given fainting than is probably accorded at the present time. Given two individuals, one who faints having a temperature of 102° F., and another who does not with a temperature of 104° or more, it is preferable to accept the latter as an applicant. In fact, the first individual would be disqualified. Somewhat the same conclusion is warranted as to those who faint at the sight of blood or disagreeable sights of one type or another. The manner in which pain is borne is also a good criterion of the stability of the individual.

151. Insomnia.—Insomnia includes besides sleeplessness, broken and interrupted sleep. The diagnosis of insomnia should be made with care as the normal amount for different individuals varies and depends usually on the age and habit. Most psychoneurotics do not show the physical effects of sleeplessness. Insomnia is a symptom, not a disease.

a. Insomnia has been classified as—

(1) Toxic insomnia, such as due to excessive use of tobacco, coffee, tea, and alcohol.

(2) Extrinsic insomnia, such as following mental traumata. Actual physical causes.

b. Insomnia of either type disqualifies the applicant and grounds the flyer.

Example:

Lieut. "X." Unable to sleep. Paced the floor at night.

Result: One of the "crashes" ascribed to the Air Mail.

152. Memory.—Memory is of concern insofar as defects may be uncovered. The type of applicant and student officer who reports for training is of such educational caliber that memory of itself should approximate "an hypothetical norm." An injury or illness severe enough to produce memory defect of an extended period of time is surely sufficient ground for disqualification. Sequelae must have resulted from the injury or illness that will have left its scar on the brain itself as well as the personality. It is not believed a safe procedure to allow anyone who is not a rated pilot or observer to continue with his flying who has complete amnesia of his accident or injury, or of a considerable period of time prior to and following the occasion.

Examples:

a. Cadet "A". Automobile accident. Has no memory of events occurring from the time he left his post, of his accident, nor for a period of 3 days following.

b. Cadet "B". Automobile accident. Complete amnesia of events leading up to his accident, of the death of the other two occupants of his car, and for a period of 14 days following. Of further interest in

this case is the fact that the patient will not be convinced that deaths did occur in his accident.

Neither of these cadets should be allowed to continue their training. In the case of rated pilots and observers, a guarded and studied opinion as to their continuing flying is required. It is, perhaps, better for them that they have amnesia of the events of their "crash." However, if any personality changes or defects are noted, permanent grounding is obligatory.

153. Phobias.—Phobias represent specific fears containing the elements of conversion, and stimulate obsessive ideas. Anxiety is a constant component of phobias. Phobias are therefore expressions of fundamental instability. When phobias are elicited, disqualification for flying training should be imperative.

154. Anxiety.—Manifest anxiety, due to any cause whatsoever, is disqualifying. Anxiety is closely related to fear. Fear is a defensive reaction of the organism from dangers in the environment; while in anxiety, on the other hand, the danger is represented in a mental image. Panic is not far distant from either fear or anxiety. Any of these symptoms show an underlying sense of insecurity, and as such have no place in flying of any sort.

155. Cycloids and schizoids.—Cycloids must not necessarily be manic-depressives nor the schizoids, schizophrenics. The terms have nothing to do with the question of being pathological or healthy. They are large biological types which include the great mass of healthy individuals with the corresponding psychotics scattered among them. Elation and depression are characteristic of the cycloid group, and irritability and apathy are found among the schizoids, although found in other conditions as well. In any event, an appreciable disturbance in any of these findings should be sufficient grounds for the cessation of all flying activities of the individual involved and permanent disqualification of the cadet or student officer.

Paragraph 32b (26), AR 40-110, states that "in the study of the examinee a review is made of his total experience. Each candidate will be found to have met with situation difficulties requiring solution. The extent and type of these difficulties will vary with the individual. The manner in which he has met worries, handled conflicts, and sublimated complexes is an indication of the degree to which he can adjust himself to his environment. The study should determine whether he is inherently stable or unstable.

156. Extroversion and introversion.—Extroversion and introversion have to do with the energy trends. They have reference to psychobiological energy. All individuals possess both mechanisms and

it is only the predominance of one or the other which determines the type. They are, as Jung termed them, "general-attitude types."

157. Selection of candidates for flying.—It is being taught in the Department of Neuropsychiatry that insofar as the candidate is being classified, it first be determined whether he shows a predominance of extrovertive or introvertive tendencies and then add to this classification the various psychological mechanisms involved in his adjustment to his environment or reality. The degree of facility of adjustment may be a criterion of the individual's aptitude to meet a new environment such as is encountered in flying. Such has not been proved, although it is reasonable to believe that those with a greater degree of facility of adjustment should adjust themselves more readily. The important factor is to believe that the inherently stable individual makes the ideal military pilot, and endeavor to determine whether or not the applicant is herently stable or unstable. Perhaps too much prominence has been given to these opinions without adequate research work to justify the conclusions arrived at. However, flight surgeons can perhaps determine whether the applicant for flying has a proper sensory, central and motor nervous system, whether or not he has an adequate memory function, whether he sublimates or symbolizes, whether or not he is an inherently stable or unstable individual, whether he is an introvert or extrovert, but cannot determine that he will or will not learn to fly. However, flight surgeons can pass upon and present for flying instruction the best material available, those individuals who do not show the various factors, both physical and mental, that have been found detrimental to the successful development of a military pilot, insofar as the present knowledge of successful material is limited.

APPENDIX

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INDEX

	Paragraphs	Pages
Accessorius.....	140	154
Action disorders.....	26	42
Adler hypothesis.....	12	21
Affectivity of emotional disorders.....	27	44
Age, epilepsy.....	44	67
Anatomy of epilepsy, pathological.....	47	73
Anxiety.....	154	161
Articulation.....	142	155
Attacks, epilepsy, frequency.....	42	67
Attention disorders.....	29	44
Basic fundamentals, mental.....	2	2
Behavior, dynamics.....	14	23
Bibliography.....	App.	162
Brain tumor, psychoses with.....	117	138
Candidates for flying, selection.....	157	162
Casual factors, paralysis of insane.....	91	114
Cerebral syphilis, psychoses with.....	116	137
Character of epilepsy.....	49	82
Characteristic symptoms, schizophrenia (dementia praecox).....	59	92
Circulation, peripheral.....	146	158
Classification:		
Mental disorders.....	18-21	32
Psychopathic personality.....	34	48
Psychoses.....	21	32
Tremors.....	144	156
Clinical varieties of epilepsy.....	50	83
Complex.....	31	45
Conflict, solving.....	7	16
Constitution types, psychobiological.....	17	29
Content of thought disorders.....	24	41
Cranial nerves.....	135	151
Cycloids.....	155	161
Definitions:		
Epidemic encephalitis.....	122	143
Epilepsy.....	45	67
Mental process terms.....	5	12
Minor psychoses.....	35	52
Manic-depressive psychosis.....	64	99
Paralysis of insane.....	87	113
Psychopathic personality.....	33	47
Tabes dorsalis.....	100	126
Dementia praecox (schizophrenia).....	55-62	88
Descriptive psychology.....	4-9	6
Diagnosis:		
Differential:		
Epilepsy.....	154	161
Infection exhaustion.....	110	131
Involutional melancholia.....	77	108
Manic-depressive psychosis.....	72	105

Diagnosis—Continued.

Differential—Continued.

	Paragraphs	Pages
Paranoia.....	83	112
Paralysis of insane.....	98	124
Psychosis.....	112	132
Schizophrenia (dementia praecox).....	62	97
Tabes dorsalis.....	105	128
Epidemic encephalitis.....	131	148
Epilepsy.....	53	84
Paranoia.....	82	112
Tabes dorsalis.....	104	128

Disease, mental:

History.....	3	3
Symptoms.....	22-32	37

Disorders, mental:

Action.....	26	42
Affectivity of emotional disorders.....	27	44
Attention.....	29	44
Complex.....	31	45
Content of thought.....	24	41
Dreams.....	32	46
Emotion.....	27	44
Feeling.....	27	44
Insanity, use of term.....	18	32
Memory.....	28	44
Personality.....	30	45
Perception.....	23	38
Point of view.....	19	32
Psychosis, classification.....	20, 21	32
Train of thought.....	25	42
Volition.....	26	42

Distribution of epilepsy.....	40	66
-------------------------------	----	----

Disturbance of self-consciousness.....	30	45
--	----	----

Dreams.....	32	46
-------------	----	----

Dynamics of behavior.....	14	23
---------------------------	----	----

Emotion:

Unconscious.....	9	17
Disorders.....	27	44

Epidemic encephalitis.....	121-133	143
----------------------------	---------	-----

Course.....	128	147
Definition.....	122	143
Diagnosis.....	131	148
Duration.....	128	147
Etiology.....	125	144
History.....	123	143
Pathology.....	126	145
Prognosis.....	132	150
Recurrences.....	129	147
Relation to other diseases.....	124	143
Sequelae.....	130	148
Treatment.....	133	150

INDEX

	Paragraphs	Pages
Epilepsy	39-54	66
Age.....	44	67
Clinical varieties.....	50	83
Definition.....	45	67
Diagnosis.....	53, 54	84, 85
Distribution.....	40	66
Epileptic character.....	49	82
Etiology.....	46	71
Frequency of attack.....	42	67
History.....	39	66
Pathological anatomy.....	47	73
Prevalence.....	41	66
Prognosis.....	52	84
Season.....	43	67
Sequelae.....	51	84
Sex.....	44	67
Symptomatology.....	48	73
Time.....	43	67
Epileptic equivalents	150	159
Etiology:		
Epidemic encephalitis.....	125	144
Epilepsy.....	46	71
Manic-depressive psychosis.....	67	100
Paralysis of insane.....	90	114
Psychoses.....	109	131
Schizophrenia (dementia praecox).....	56	89
Tabes dorsalis.....	101	127
Extroversion	156	161
Facial nerve, paralysis and lesions	137, 138	152, 153
Feeling disorders	27	44
Fixation of libido	8	16
Frequency:		
Epilepsy attacks.....	42	67
Manic-depressive psychosis.....	65	99
Paralysis of insane.....	88	113
Freudian hypothesis	11	20
Fundamental problem of life	6	13
Fundamentals, basic, mental	2	2
Glosso-pharyngeal nerve	139	154
History:		
Epidemic encephalitis.....	121-133	143
Epilepsy.....	39	66
Mental disease.....	3	3
Paralysis of insane.....	86	113
Hypoglossus	141	154
Hypothesis:		
Adler.....	12	21
Freudian.....	11	20
Hysteria	37	58
Infection exhaustion psychoses	110	131

	Paragraphs	Pages
Injury to the brain.....	115	137
Insane, paralysis.....	86-99	113
Insanitiy, use of term.....	18	32
Insomnia.....	151	160
Interpretation, manic-depressive psychosis.....	73	105
Introversion.....	156	161
Involutional melancholia.....	74	106
Knee-jerk.....	147	158
Lesions of facial nerve.....	138	153
Libido, fixation.....	8	16
Life problem, fundamental.....	6	13
Manic-depressive psychosis:		
Course.....	69	104
Definition.....	64	99
Differential diagnosis.....	72	105
Duration.....	69	104
Etiology.....	67	100
Frequency.....	65	99
History.....	63	98
Interpretation.....	73	105
Onset.....	69	104
Pathology.....	71	105
Prognosis.....	70	104
Remissions.....	69	104
Sex.....	66	100
Summary.....	73	105
Symptomatology.....	68	100
Time of life.....	66	100
Melancholia, involuntional:		
Definition.....	74	106
Differential diagnosis.....	77	108
Prognosis.....	76	108
Symptomatology.....	75	107
Treatment.....	78	108
Memory.....	152	160
Mental disease:		
Causes.....	10-13	18
Dreams.....	32	46
History.....	3	3
Nature.....	10-13	18
Symptoms.....	22	37
Mental disorders:		
Action.....	26	42
Affectivity.....	27	44
Attention.....	29	44
Causes.....	13	22
Classification, types.....	17	29
Content of thought.....	24	41
Contributing causes.....	13	22
Emotion.....	27	44

INDEX

Mental disorders—Continued.	Paragraphs	Pages
Feeling.....	27	44
Memory.....	28	44
Perception.....	23	38
Personality.....	30	45
Train of thought.....	25	42
Volition.....	26	42
Mental mechanisms and motives.....	15	25
Mental processes.....	4, 5	6, 12
Minor psychoses:		
Definition.....	35	52
Hysteria.....	37	58
Neurasthenia.....	36	56
Psychasthenias.....	38	63
Nature of mental disease.....	10-13	18
Nerves:		
Accessory.....	140	154
Cranial.....	135	151
Facial, paralysis and lesions.....	137, 138	152, 153
Glosso-pharyngeal.....	139	154
Hypoglossus.....	141	154
Pneumogastric.....	139	154
Trigeminal.....	136	151
Neurasthenia.....	36	56
Neurology.....	134-142	150
Articulation.....	142	155
Description.....	134	150
Nerves.....	135-141	151
Neuropsychiatric examination.....	143-157	155
Organic diseases of the brain.....	115	137
Paranoia:		
Definition.....	79	108
Diagnosis.....	82, 83	112
Prognosis.....	84	112
Stages.....	81	110
Treatment.....	85	112
Types.....	80	109
Paralysis of insane:		
Casual factors.....	91	114
Course.....	93	117
Definition.....	87	113
Diagnosis, differential.....	98	124
Duration.....	93	117
Etiology.....	90	114
Frequency.....	88	113
History.....	86	113
Onset.....	93	117
Pathological anatomy.....	92	115
Prognosis.....	94	117
Remissions.....	93	117
Summary, mental symptoms.....	97	123

Paralysis of insane—Continued.	Paragraphs	Pages
Symptomatology.....	95	117
Tabetic forms.....	96	123
Time of life.....	89	114
Treatment.....	99	125
Pathological anatomy:		
Epilepsy.....	47	73
Paralysis of insane.....	92	115
Pathology:		
Epidemic encephalitis.....	126	145
Manic-depressive psychosis.....	71	105
Tabes dorsalis.....	102	127
Phobias.....	153	161
Pneumogastric nerves.....	139	154
Point of view in studying cases.....	19	32
Prevalence of epilepsy.....	41	66
Problem of life, fundamental.....	6	13
Processes, mental.....	4, 5	6, 12
Prognosis:		
Epidemic encephalitis.....	132	150
Epilepsy.....	52	84
Manic-depressive psychosis.....	70	104
Melancholia.....	76	108
Paranoia.....	84	112
Paralysis of insane.....	94	117
Tabes dorsalis.....	106	129
Psychobiological constitution and reaction types:		
Extroversion.....	16, 17	28, 29
Introversion.....	16, 17	28, 29
Psychasthenias.....	38	63
Psychopathic personality.....	33, 34	47, 48
Psychoses:		
Brain tumor.....	117	138
Classification.....	21	32
Cerebral syphilis.....	116	137
Diseases, organic of the brain.....	115	137
Infection exhaustion.....	108-110	130
Differential diagnosis.....	112	132
Symptomatology.....	111	132
Injury to the brain.....	115	137
Symptomatic.....	108, 109, 114	130, 131, 135
Senile, types.....	119, 120	140
Toxic.....	108, 109, 113	130, 131, 132
Traumatic.....	118	139
Psychosis.....	20, 108	32, 130
Reaction types, psychobiological.....	17	29
Recurrence of epidemic encephalitis.....	129	147
Relation of epidemic encephalitis to other diseases.....	124	142

INDEX

	Paragraphs	Pages
Remissions:		
Manic-depressive psychosis.....	69	104
Paralysis of insane.....	93	117
Schizophrenia (dementia praecox):		
Course.....	61	96
Diagnosis, differential.....	62	97
Etiology.....	56	89
Pathology.....	57	89
Prognosis.....	61	96
Symptomatology.....	58	90
Symptoms, characteristic.....	59	92
Types.....	60	92
Schizoids.....	155	161
Season, epilepsy.....	43	67
Selection of candidates for flying.....	157	162
Self-consciousness, disturbances.....	30	45
Sequelae:		
Epidemic encephalitis.....	130	148
Epilepsy.....	51	84
Sex:		
Epilepsy.....	44	67
Manic-depressive psychosis.....	66	100
Solving of conflict.....	7	16
Stages of paranoia.....	81	110
Survey of neuropsychiatric examination.....	143-157	155
Anxiety.....	154	161
Classification of tremors.....	144	156
Cycloids.....	155	161
Description.....	143	155
Epileptic equivalents.....	150	159
Extroversion.....	156	161
History of applicant.....	148	158
Insomnia.....	151	160
Introversion.....	156	161
Knee-jerk.....	147	158
Memory.....	152	160
Peripheral circulation.....	146	158
Phobias.....	153	161
Psychomotor tension.....	145	157
Schizoids.....	155	161
Symptoms:		
Mental disease:		
Classification.....	22	37
Disorders:		
Action.....	26	42
Affectivity.....	27	44
Attention.....	29	44
Complex.....	31	45
Content of thought.....	24	41
Dreams.....	32	46
Emotion.....	27	44
Feeling.....	27	44

Symptoms—Continued.

Mental disease—Continued.

Disorders—Continued.

	Paragraphs	Pages
Memory.....	28	44
Perception.....	23	38
Personality.....	30	45
Train of thought.....	25	42
Volition.....	26	42
Tabes dorsalis.....	103	127
Symptomatology:		
Epilepsy.....	48	73
Manic-depressive psychosis.....	68	100
Paralysis of insane.....	95	117
Psychoses.....	111	132
Schizophrenia (dementia praecox).....	58	90
Syphilis, cerebral, psychoses with.....	116	137
Tabes dorsalis:		
Definition.....	100	126
Diagnosis.....	104, 105	128
Etiology.....	101	127
Pathology.....	102	127
Prognosis.....	106	129
Symptoms.....	103	127
Treatment.....	107	129
Tabetic forms, paralysis of insane.....	96	123
Time, epilepsy.....	43	67
Time of life:		
Manic-depressive psychoses.....	66	100
Paralysis of the insane.....	89	114
Toxic psychoses.....	113	132
Train of thought disorders.....	25	42
Treatment:		
Epidemic encephalitis.....	133	150
Melancholia, involutional.....	78	108
Paranoia.....	85	112
Paralysis of insane.....	99	125
Tabes dorsalis.....	107	129
Unconscious emotion.....	9	17
Use of alcohol, medicine, and tobacco, neuropsychiatrics.....	149	159
Varieties of epilepsy, clinical.....	50	83
Volition, disorders.....	26	42

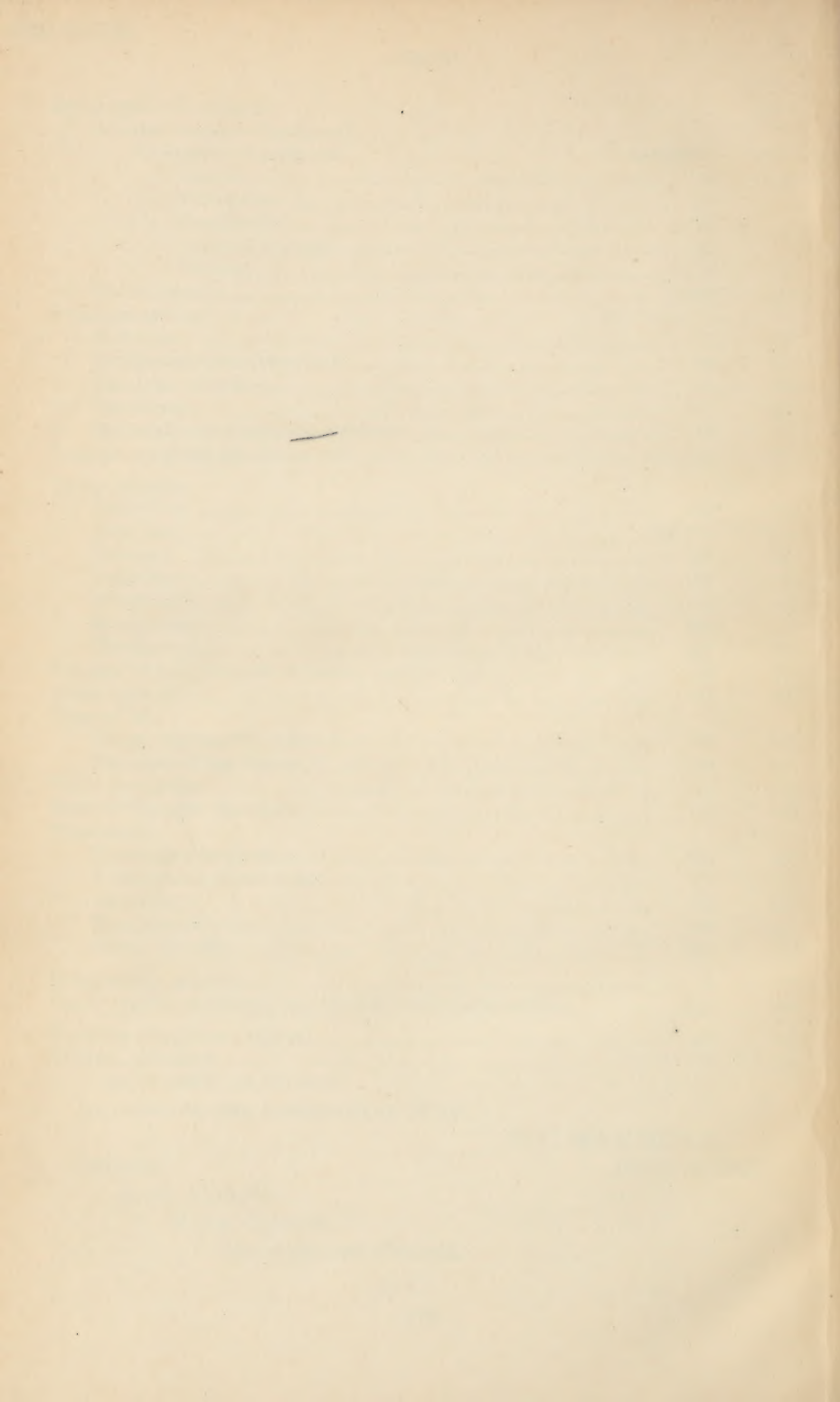
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